

CORNELL UNIVERSITY

OFFICIAL PUBLICATION

APRIL 15, 1948

College of Arts and Sciences

ANNOUNCEMENT
FOR 1948-1949 SESSIONS



The University Calendar

1948-1949

FALL TERM

Registration September 20-21, *Monday and Tuesday*
Instruction begins Sept. 22, *Wednesday*, 1 p.m.
Thanksgiving recess:
 Instruction suspended Nov. 24, *Wednesday*, 12:50 p.m.
 Instruction resumed Nov. 29, *Monday*, 8 a.m.
Christmas recess:
 Instruction suspended Dec. 18, *Saturday*, 12:50 p.m.
 Instruction resumed Jan. 3, 1949, *Monday*, 8 a.m.
Examinations begin Jan. 24, *Monday*
Examinations end Feb. 2, *Wednesday*
Midyear holiday Feb. 3, *Thursday*

SPRING TERM

Registration Feb. 4-5, *Friday and Saturday*
Instruction begins Feb. 7, *Monday*, 8 a.m.
Spring recess:
 Instruction suspended March 26, *Saturday*, 12:50 p.m.
 Instruction resumed April 4, *Monday*, 8 a.m.
Examinations begin May 30, *Monday*
Examinations end June 7, *Tuesday*
Commencement Day June 13, *Monday*

CORNELL UNIVERSITY OFFICIAL PUBLICATION

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FACULTY

EDMUND EZRA DAY, Ph.D., LL.D., President of the University.
Dean of the College of Arts and Sciences.

MELVIN LOVELL HULSE, Ph.D., Assistant Dean and Secretary of the College
of Arts and Sciences, and Associate Professor of Education.

BLANCHARD LIVINGSTONE RIDEOUT, Ph.D., Assistant Dean and Associate
Professor of Romance Literature.

MEYER HOWARD ABRAMS, Ph.D., Associate Professor of English.

GEORGE PLIMPTON ADAMS, Ph.D., Associate Professor of Economics.

HENRY HITCH ADAMS, Ph. D., Instructor in English.

HOWARD BERNHARDT ADELMANN, Ph.D., Professor of Histology and Em-
bryology.

FREDERICK BROWNING AGARD, Ph.D., Associate Professor of Linguistics.

RALPH PALMER AGNEW, Ph.D., D.Sc., Professor of Mathematics.

**HARRY DARKES ALBRIGHT, Ph.D., Associate Professor of Speech and Drama.

ARTHUR AUGUSTUS ALLEN, Ph.D., Professor of Ornithology.

ALFRED LEONARD ANDERSON, Ph.D., Associate Professor of Geology.

ALBERT LEROY ANDREWS, Ph.D., Professor of Germanic Philology, Emeritus.

EUGENE PLUMB ANDREWS, A.B., Professor of Archaeology, Emeritus.

ROBERT LOWELL ARENDS, B.D., Instructor in English.

CARROLL C. ARNOLD, Ph.D., Assistant Professor of Speech and Drama.

WILLIAM WEAVER AUSTIN, A.M., Assistant Professor of Music.

*ROBERT FOX BACHER, Ph.D., Professor of Physics.

CHARLES PARKER BAKER, Ph.D., Assistant Professor in the Laboratory of
Nuclear Studies.

ROBERT CECIL BALD, Ph.D., D.Litt., Professor of English.

WILDER DWIGHT BANCROFT, Ph.D., D.Sc., LL.D., Professor of Physical
Chemistry, Emeritus.

LEROY LESHER BARNES, Ph.D., Associate Professor of Biophysics.

MILTON L. BARNETT, A.B., Instructor in Sociology.

EDWARD LEWIS BASSETT, Ph.D., Instructor in Classics.

SIMON H. BAUER, Ph.D., Associate Professor of Chemistry.

FREDERICK BEDELL, Ph.D., Professor of Physics, Emeritus.

MADISON BENTLEY, Ph.D., Professor of Psychology, Emeritus.

**HANS ALBRECHT BETHE, Ph.D., John Wendell Anderson Professor of Physics.

***KNIGHT BIGGERSTAFF, Ph.D., Professor of Chinese History.

MORRIS GILBERT BISHOP, Ph.D., Kappa Alpha Professor of the Romance
Languages and Literatures.

MORTON EDWARD BITTERMAN, Ph.D., Assistant Professor of Psychology.

MAX BLACK, Ph.D., Professor of Philosophy.

DONALD CONGDON BLANDING, M.A., Instructor in Speech and Drama.

ALFRED T. BLOMQUIST, Ph.D., Associate Professor of Chemistry.

ALBERT WILHELM BOESCHE, Ph.D., Professor of German, Emeritus.

*Leave of absence, 1948-1949.

**Leave of absence, Fall term, 1948-1949.

***Leave of absence, Spring term, 1948-1949.

- PAUL COLGAN BOOMSLITER, Ph.D., Assistant Professor of Speech.
- SAMUEL LATIMER BOOTHROYD, M.S., Professor of Astronomy, Emeritus.
- JAMES CHESTER BRADLEY, Ph.D., Professor of Entomology and Curator of Invertebrate Zoology.
- JULIAN PLEASANT BRETZ, Ph.D., Professor of American History, Emeritus.
- HERBERT WHITTAKER BRIGGS, Ph.D., Professor of International Law.
- THOMAS ROLAND BRIGGS, Ph.D., Professor of Physical Chemistry.
- LESLIE NATHAN BROUGHTON, Ph.D., Professor of English, Emeritus.
- STUART MACDONALD BROWN, Ph.D., Assistant Professor of Philosophy.
- JAMES DABNEY BURFOOT, JR., Ph.D., Associate Professor of Geology.
- EDWIN ARTHUR BURTT, Ph.D., Susan Linn Sage Professor of Philosophy.
- JULIAN EDWARD BUTTERWORTH, Ph.D., Professor of Education.
- CORNELIUS KENNEDY CAIN, Ph.D., Assistant Professor of Chemistry.
- WILLIAM A. CAMPBELL, M.A., Assistant Professor of Music.
- HARRY CAPLAN, Ph.D., Goldwin Smith Professor of the Classical Languages and Literatures.
- ROBERT ROSE CARSON, M.A., Instructor in Speech and Drama.
- WALTER BUCKINGHAM CARVER, Ph.D., Professor of Mathematics.
- WILLIAM M. CASHIN, Ph.D., Instructor in Chemistry.
- EMILE MONNIN CHAMONT, Ph.D., Professor of Chemistry, Emeritus.
- GIRAUD CHESTER, Ph.D., Assistant Professor of Speech and Drama.
- JOHN A. CLAUSEN, M.A., Assistant Professor of Sociology.
- ROBERT THEODORE CLAUSEN, Ph.D., Associate Professor of Botany.
- GUISEPPE CÖCCONI, Ph.D., Research Associate in the Laboratory of Nuclear Studies.
- VANNA TONGIORGI CÖCCONI, Ph.D., Research Associate in the Laboratory of Nuclear Studies.
- W. STORRS COLE, Ph.D., Professor of Geology.
- LANE COOPER, Ph.D., Litt.D., Professor of the English Language and Literature, Emeritus.
- DALE RAYMOND CORSON, Ph.D., Associate Professor of Physics.
- LEONARD SLATER COTTRELL, JR., Ph.D., Professor of Sociology.
- ERNEST DAVID COURANT, Ph.D., Research Associate in the Laboratory of Nuclear Studies.
- J MILTON COWAN, Ph.D., Professor of Linguistics and Director of the Division of Modern Languages.
- GEORGE FERRIS CRONKHITE, M.A., Instructor in English.
- G. WATTS CUNNINGHAM, Ph.D., Litt.D., Susan Linn Sage Professor of Philosophy.
- OTIS FREEMAN CURTIS, Ph.D., Professor of Botany.
- JOHN HAMILTON CURTISS, Ph.D., Assistant Professor of Mathematics.
- ROBERT E. CUSHMAN, Ph.D., Litt.D., Goldwin Smith Professor of Government.
- DAVID DAICHES, D.Phil., Professor of English.
- GEORGE IRVING DALE, Ph.D., Professor of Romance Literature.
- KARL M. DALLENBACH, Ph.D., Susan Linn Sage Professor of Psychology.
- ROBERT H. DALTON, M.A., Professor of Child Development and Family Relationships.
- PETER J. W. DEBYE, Dr. Phil., Professor of Chemistry.

- CORNELIS WILLEM DE KIEWIET, Ph.D., Professor of Modern European History.
- DELOS F. DETAR, Ph.D., Instructor in Chemistry.
- JOHN W. DEWIRE, JR., Ph.D., Assistant Professor of Physics.
- ALEXANDER M. DRUMMOND, A.M., L.H.D., Professor of Speech and Drama.
- CHARLES LOVE DURHAM, Ph.D., Litt.D., Professor of Latin, Emeritus.
- ARTHUR JOHNSON EAMES, Ph.D., Professor of Botany.
- MARIO EINAUDI, Dr. Jur., Professor of Government.
- ROBERT HENRY ELIAS, A.M., Instructor in English.
- OSKAR DIEDRICH VON ENGELN, Ph.D., Professor of Geology.
- DONALD ENGLISH, B.S., M.B.A., Professor of Economics.
- GORDON HUBERT FAIRBANKS, M.A., Assistant Professor of Linguistics.
- ALBERT BERNHARDT FAUST, Ph.D., Professor of German, Emeritus.
- WILLIAM FELLER, Ph.D., Professor of Mathematics.
- RICHARD P. FEYNMAN, Ph.D., Associate Professor of Physics.
- DONALD F. FINLAYSON, M.A., Professor of Fine Arts.
- WILLIAM WELCH FLEXNER, Ph.D., Associate Professor of Mathematics.
- EDWARD W. FOX, Ph.D., Assistant Professor of History.
- F. BARRON FREEMAN, M.A., Assistant Professor of English.
- FRANK SAMUEL FREEMAN, Ed.D., Professor of Education and Psychology.
- WALTER HOYT FRENCH, Ph.D., Associate Professor of English.
- CARL WITZ GARTLEIN, Ph.D., Curator in Physics.
- PAUL WALLACE GATES, Ph.D., Professor of American History.
- ROSWELL CLIFTON GIBBS, Ph.D., Professor of Physics, Emeritus.
- PERRY WEBSTER GILBERT, Ph.D., Associate Professor of Zoology.
- WILSON BARR GRAGG, M.A., Instructor in English.
- GUY EVERETT GRANTHAM, Ph.D., Professor of Physics.
- KENNETH INGVAR GREISEN, Ph.D., Associate Professor of Physics.
- DONALD REDFIELD GRIFFIN, Ph.D., Associate Professor of Zoology.
- DONALD JAY GROUT, Ph.D., Professor of Music.
- HENRY E. GUERLAC, Ph.D., Professor of the History of Science.
- *LOUIS GUTTMAN, Ph.D., Associate Professor of Sociology.
- JAMES WINFORD HALL, M.A., Instructor in English.
- ROBERT ANDERSON HALL, Litt.D., Associate Professor of Linguistics.
- GILBERT DENNISON HARRIS, Ph.D., Professor of Paleontology and Stratigraphic Geology, Emeritus.
- PAUL LEON HARTMAN, Ph.D., Associate Professor of Physics.
- MAURICE A. HATCH, M.A., Instructor in English.
- BAXTER HATHAWAY, Ph.D., Assistant Professor of English.
- GEORGE HARRIS HEALEY, Ph.D., Assistant Professor of English.
- HALLDOR HERMANNSSON, Ph.D., Professor of the Scandinavian Languages and Literatures, Emeritus.
- GLENN WASHINGTON HERRICK, B.S., Professor of Economic Entomology, Emeritus.
- JAMES LYNN HOARD, Ph.D., Professor of Chemistry.
- CHARLES FRANCIS HOCKETT, Ph.D., Assistant Professor of Linguistics.
- ERNEST HARRISON HOFER, M.A., Instructor in English.
- JOSEPH DOUGLAS HOOD, Ph.D., Associate Professor of Biology.

*Leave of absence, 1948-1949.

- HARLEY EARL HOWE, Ph.D., Professor of Physics.
 ROBERT LESLIE HULL, Ph.D., Assistant Professor of Music.
 WALLIE ABRAHAM HURWITZ, Ph.D., Professor of Mathematics.
 JOHN GREENWOOD BROWN HUTCHINS, Ph.D., Professor of Economics.
 FREDERICK BRUCE HUTT, Ph.D., D.Sc., Professor of Zoology.
 JAMES HUTTON, Ph.D., Professor of the Classics.
 ELIAS HUZAR, Ph.D., Associate Professor of Government.
 OSKAR AUGUSTUS JOHANNSEN, Ph.D., Professor of Entomology, Emeritus.
 JOHN RAVEN JOHNSON, Ph.D., Professor of Organic Chemistry.
 BURTON WADSWORTH JONES, Ph.D., Professor of Mathematics.
 CHARLES WILLIAM JONES, Ph.D., Associate Professor of English.
 HORACE LEONARD JONES, Ph.D., LL.D., Professor of Greek, Emeritus.
 WILLIAM B. JONES, JR., Ph.D., Research Associate in the Laboratory of Nuclear Studies.
 RIVERDA HARDING JORDAN, Ph.D., Professor of Education, Emeritus.
 MARK KAC, Ph.D., Professor of Mathematics.
 ALFRED E. KAHN, Ph.D., Assistant Professor of Economics.
 MYRON SLADE KENDRICK, Ph.D., Professor of Economics.
 OTTO KINKELDEY, Ph.D., Professor of Musicology, Emeritus.
 JOHN KIRKPATRICK, Associate Professor of Music.
 GORDON M. KIRKWOOD, Ph.D., Instructor in the Classics.
 LEWIS KNUDSON, Ph.D., Professor of Botany.
 GEORGE KREEZER, Ph.D., Assistant Professor of Psychology.
 RUSSELL MORSBY LADUE, JR., M.A., Instructor in English.
 MAX LUDWIG WOLFRAM LAISTNER, M.A., Litt.D., John Stambaugh Professor of History.
 HERMANN WALTHER VICTOR LANGE, Ph.D., Professor of German Literature.
 ALBERT WASHINGTON LAUBENGAYER, Ph.D., Professor of Chemistry.
 ALEXANDER HAMILTON LEIGHTON, M.D., Professor of Sociology.
 ***SAMUEL LEESON LEONARD, Ph.D., Associate Professor of Zoology.
 JOSEPH S. LEVINGER, M.A., Instructor in Physics.
 HOWARD SCOTT LIDDELL, Ph.D., Professor of Psychobiology.
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 FRANKLIN A. LONG, Ph.D., Professor of Chemistry.
 PAUL LORRAIN, Ph.D., Research Associate in the Laboratory of Nuclear Studies.
 BOYCE DAWKINS McDANIEL, Ph.D., Assistant Professor of Physics.
 NORMAN MALCOM, Ph.D., Assistant Professor of Philosophy.
 **FREDERICK GEORGE MARCHAM, Ph.D., Goldwin Smith Professor of English History.
 FREDERICK L. MARCUSE, Ph.D., Assistant Professor of Psychology.
 CLYDE WALTER MASON, Ph.D., Professor of Chemistry.
 JAMES FREDERICK MASON, Ph.D., Professor of Romance Languages and Literatures, Emeritus.
 ROBERT MATHESON, Ph.D., Professor of Economic Entomology.
 ERNEST GEORGE MERRITT, M.E., Professor of Physics, Emeritus.

**Leave of absence, Fall term, 1948-1949.

***Leave of absence, Spring term, 1948-1949.

- E. STEPHEN MERTON, M.A., Instructor in English.
 WILLIAM T. MILLER, Ph.D., Professor of Chemistry.
 FRANCIS MINEKA, Ph.D., Associate Professor of English.
 BENTON SULLIVAN MONROE, Ph.D., Professor of English, Emeritus.
 ROYAL EWERT MONTGOMERY, Ph.D., Professor of Economics.
 NORMAN S. MOORE, M.D., Research Associate in Psychobiology.
 PHILIP MORRISON, Ph.D., Assistant Professor of Physics.
 JOSEPH E. MORTON, Ph.D., Professor of Statistics.
 WILLIAM GAMWELL MOULTON, Ph.D., Associate Professor of Linguistics.
 CARLETON CHASE MURDOCK, Ph.D., Professor of Physics.
 *ARTHUR EDWARD MURPHY, Ph.D., Professor of Philosophy.
 EARLE E. MUSCHLITZ, JR., Ph.D., Instructor in Chemistry.
 HENRY ALONZO MYERS, Ph.D., Professor of English.
 VLADIMIR NABOKOV, A.B., Associate Professor of Russian Literature.
 JAMES GEORGE NEEDHAM, Ph.D., Litt.D., Sc.D., Professor of Entomology
 and Limnology, Emeritus.
 CURTIS PUTNAM NETTELS, Ph.D., Professor of American History.
 CHARLES MERRICK NEVIN, Ph.D., Professor of Geology.
 HERBERT FRANK NEWHALL, Ph.D., Assistant Professor of Physics.
 MELVIN LORREL NICHOLS, Ph.D., Professor of Analytical Chemistry.
 CLARK SUTHERLAND NORTHUP, Ph.D., D.Litt., Professor of English,
 Emeritus.
 DAVID NOVARR, M.A., Instructor in English.
 EDWIN NUNGEZER, Ph.D., Associate Professor of English.
 JOHN DEASON OGDEN, M.A., Instructor in English.
 ROBERT MORRIS OGDEN, Ph.D., Professor of Psychology, Emeritus.
 PAUL MARTIN O'LEARY, Ph.D., Professor of Economics.
 ROBERT M. PALMER, M.M., Assistant Professor of Music.
 ***JAMES WENCESLAS PAPEZ, A.B., M.D., Professor of Anatomy.
 **JACOB PAPISH, Ph.D., Professor of Chemistry.
 ANGELA PARATORE, M.A., Instructor in Modern Languages.
 LYMAN GEORGE PARRATT, Ph.D., Associate Professor of Physics.
 N. ALLEN PATTILLO, Ph.D., Instructor in Fine Arts.
 LOREN CLIFFORD PETRY, Ph.D., Professor of Botany.
 HARRY POLLARD, Ph.D., Assistant Professor of Mathematics.
 HENRY FRANCIS POMMER, Ph.D., Instructor in English.
 BRUNO PONTECORVO, Ph.D., Associate Professor of Physics.
 PAUL RUSSEL POPE, Ph.D., Professor of German, Emeritus.
 HARVEY WALTER POSVIC, Ph.D., Instructor in Chemistry.
 FREDERICK CLARKE PRESCOTT, A.B., L.H.D., Professor of English, Emeritus.
 FRAMPTON PRICE, Instructor in Psychology.
 LAURENCE PUMPELLY, Ph.D., Professor of the Romance Languages and
 Literatures, Emeritus.
 EUNICE RAIMON, A.B., Instructor in English.
 HAROLD LYLE REED, Ph.D., Robert Julius Thorne Professor of Economics.
 RICHARD A. REINHARDT, Ph.D., Instructor in Chemistry.

*Leave of absence, 1948-1949.

**Leave of absence, Fall term, 1948-1949.

***Leave of absence, Spring term, 1948-1949.

- EDWIN PIERCE REUBENS, M.A., Acting Assistant Professor of Economics.
 HEINRICH RIES, Ph.D., Professor of Geology, Emeritus.
 ROSAMUND ROBINSON, A.B., Instructor in English.
 J.BARKLEY ROSSER, Ph.D., Professor of Mathematics.
 CLINTON L. ROSSITER, Ph.D., Assistant Professor of Government.
 THOMAS ARTHUR RYAN, Ph.D., Associate Professor of Psychology.
 GEORGE HOLLAND SABINE, Ph.D., L.H.D., Susan Linn Sage Professor of Philosophy.
 JOHN SANFORD SABY, Ph.D., Instructor in Physics.
 WILLIAM MERRITT SALE, JR., Ph.D., Associate Professor of English.
 HAROLD A. SCHERAGA, Ph.D., Instructor in Chemistry.
 HEINRICH SCHNEIDER, Ph.D., Associate Professor of German Literature.
 JOHN A. SESSIONS, M.A., Instructor in English.
 HAROLD E. SHADICK, A.B., Professor of Chinese Literature.
 LESTER WHYLAND SHARP, Ph.D., Sc.D., Professor of Botany.
 *R. LAURISTON SHARP, Ph.D., Professor of Anthropology.
 FRANCIS ROBERT SHARPE, Ph.D., Professor of Mathematics, Emeritus.
 ROBERT WILLIAM SHAW, Ph.D., Associate Professor of Astronomy and Director of the Fuertes Observatory.
 ROBERT PELTON SIBLEY, M.A., L.H.D., Professor of English, Emeritus.
 MICHELL JOSEPH SIENKO, Ph.D., Instructor in Chemistry.
 HAROLD ROBERT SMART, Ph.D., Associate Professor of Philosophy.
 FREDERICK MILLER SMITH, A.B., Professor of English, Emeritus.
 LLOYD PRESTON SMITH, Ph.D., Professor of Physics.
 VIRGIL SNYDER, Ph.D., LL.D., Professor of Mathematics, Emeritus.
 FRIEDRICH SOLMSEN, Ph.D., Professor of the Classics.
 FRANK ALLAN SOUTHARD, JR., Ph.D., Professor of Economics.
 ROBERT L. SPROULL, Ph.D., Assistant Professor of Physics.
 MARGARET SQUIRE, A.B., Instructor in Music.
 MARTHA ELIZABETH STAHR, Ph.D., Assistant Professor of Astronomy.
 WALTER HUTCHINSON STANTON, Ph.D., Associate Professor of Speech and Drama.
 MARSHALL WINSLOW STEARNS, Ph.D., Assistant Professor of English.
 FREDERICK FRANKLIN STEPHAN, M.A., Professor of Sociology and Statistics.
 CARL STEPHENSON, Ph.D., Professor of History.
 JOHN STUMPF, M.A., Instructor in English.
 EDWARD ALLEN SUCHMAN, Ph.D., Assistant Professor of Sociology.
 JAMES BATCHELLER SUMNER, Ph.D., Professor of Biochemistry.
 CHARLES DANA SWARTZ, Ph.D., Research Associate in the Laboratory of Nuclear Studies.
 MARC SZEFTEL, Ph.D., LL.D., Assistant Professor of History.
 CHARLES KENNETH THOMAS, Ph.D., Professor of Speech.
 HAROLD WILLIAM THOMPSON, Ph.D., D.Litt., L.H.D., Mus.D., Professor of English.
 DIRAN HAGOPOS TOMBOULIAN, Ph.D., Associate Professor of Physics.
 BRYANT TUCKERMAN, Ph.D., Instructor in Mathematics.
 DAVID GORDON TYNDALL, M.A., Assistant Professor of Economics.
 ERVIN R. VAN ARTSDALEN, Ph.D., Assistant Professor of Chemistry.

*Leave of absence, 1948-1949.

- FREDERICK OSWIN WAAGE, Ph.D., Professor of the History of Art and Archaeology.
- ROBERT JOHN WALKER, Ph.D., Associate Professor of Mathematics.
- CHARLES I. WEIR, JR., Ph.D., Assistant Professor of English.
- HARRY PORTER WELD, Ph.D., Professor of Psychology, Emeritus.
- JOHN WEST WELLS, Ph.D., Professor of Geology.
- FREDERICK C. WHITE, A.B., Instructor in Sociology.
- HERBERT AUGUST WICHELS, Ph.D., Professor of Speech.
- WALTER F. WILLCOX, A.B., Professor of Economics and Statistics, Emeritus.
- CHRISTINE S. WILLIAMS, Ph.D., Instructor in Mathematics.
- ROBIN MURPHY WILLIAMS, Ph.D., Associate Professor of Sociology.
- ROBERT RATHBUN WILSON, Ph.D., Professor of Physics and Director of the Laboratory of Nuclear Studies.
- WILLIAM ABELL WIMSATT, Ph.D., Associate Professor of Zoology.
- ANDREW LEON WINSOR, Ph.D., Professor of Psychology.
- LLOYD A. WOOD, Ph.D., Assistant Professor of Chemistry.
- WILLIAM MOONEY WOODWARD, Ph.D., Assistant Professor of Physics.
- ALBERT HAZEN WRIGHT, Ph.D., Professor of Zoology.
- BERTRAM YOOD, Ph.D., Instructor in Mathematics.
- BENJAMIN PERCY YOUNG, Ph.D., Associate Professor of Zoology.
- CHARLES VAN PATTEN YOUNG, A.B., Professor of Physical Education, Emeritus.

COLLEGE OF ARTS AND SCIENCES

THE College of Arts and Sciences offers instruction in classical and modern languages and literatures, philosophy, and music and the fine arts; in history, the social studies, and psychology; and in mathematics and the natural sciences. The Faculty requires: (1) that each student before graduation shall pursue a course, or courses, designed to make him competent in the use of the English language; (2) that he shall demonstrate or achieve proficiency in elementary mathematics and in a foreign language; and (3) that he shall attain a basic knowledge of certain areas of the humanities, the social studies, and the natural sciences. Before the end of the second year the student must have selected a major field of study for the remainder of his work. This requirement is broadly conceived to include a sequential and a related group of courses, by means of which he may secure a degree of mastery of a specialized field of knowledge. The remainder of his course of study is largely elective under the supervision of a faculty adviser whom he chooses and who will assist him in making a reasonable and appropriate selection of courses. Many of the subject offerings of the other Colleges of the University are available to him, either as electives or as related subjects for the fulfillment of his major requirements.

The general purpose of the College of Arts and Sciences is liberal and non-technical. The definition of a liberal college is found in the subjects which make up its curriculum; namely, those subjects which, in the history of human civilization, have distinguished themselves as the means whereby man has come to understand himself and the world in which he lives. As thus conceived, a liberal education is a special knowledge of some general field of human understanding, erected upon a fundamental training, in the humanities, natural sciences, and the social studies.

The facilities of the College are adequate in staff and equipment to give personal attention to the varying needs of individual students, including requirements of a pre-vocational and pre-professional nature. Advanced courses and opportunities for research are available in the undergraduate years to those who are qualified to make use of them; and in addition to his regular courses, a student may work informally under the supervision of his major adviser (see p. 20). Thus he may complete his education in a manner more flexible than would other-

wise be possible. A student is expected to accept a large degree of responsibility for shaping his own course of study, but his adviser stands ready to assist him in all possible ways to make the most of the opportunities offered by the College.

REQUIREMENTS FOR ADMISSION

An applicant for admission to the College of Arts and Sciences must have completed a secondary school course giving satisfactory preparation for the work of the College. Fifteen units of entrance credit are required, representing at least four years' work in a preparatory or high school. The fifteen units should, in the main, be made up of English, foreign language (ancient or modern), mathematics, science, and social studies (including history). Each candidate for admission is required to take the Scholastic Aptitude Test of the College Entrance Examination Board and to request the Board to report the result to the Director of Admissions, Cornell University. Candidates are urged to take the test in December of their senior year.

Applicants for admission should consult the *General Information* circular issued by the University. This publication contains notes on expenses, including tuition charges and fees, scholarships, loan funds, and on matters of general student interest. The *General Information* circular and all other official publications of Cornell University may be obtained on application to Cornell University Official Publication, 124 Roberts Place, Ithaca, New York. Application forms are to be had from the University Director of Admissions, Administration Building, and communications concerning admission should be addressed to him.

Currently the number of applicants so far exceeds the limited number admissible that many normally eligible students must be denied entrance. A committee on Admissions selects those who seem best qualified, after a comparative study not only of formal preparation but also of evidences bearing on each applicant's character, seriousness of purpose, and fitness to undertake the work of the College.

REGISTRATION IN COURSES

During an announced period before the opening of each term, every student will, with the aid of an adviser, prepare a program of studies. For the academic year, 1948-1949, registration for the fall term will be held in the period May 3 to May 12, 1948, and registration for the spring term will be held in the period November 29 to

December 8, 1948. Program changes will be permitted during a limited period, for exceptional reasons only, without petition, upon the recommendation of the adviser. For the fall term, 1948, such changes may be made prior to August 15 by students whose schedules were submitted before August 1, and prior to September 1 by students whose schedules were submitted after August 1. For the spring term, 1949, such changes may be made prior to January 15. After these dates changes will be permitted, for extraordinary reasons only, by petition submitted during the first six days of instruction. Students failing to register during the announced periods or failing to make necessary changes within the period allowed for changes may be subject to a \$2.00 fine unless a more extreme penalty is invoked.

No student will be permitted to cancel his registration in any course unless he shall have previously obtained from the Dean authorization to do so on the ground of ill health, or for any other cause beyond the student's control.

UNDERCLASSMEN

ADVISERS

Entering freshmen and students who have been absent on leave will complete pre-registration by mail with advisers who will communicate with them in advance. On registration day, or shortly thereafter, each entering freshman and re-entering underclassman will be assigned to a member of the Advisory Board for Underclassmen, which has jurisdiction over freshmen and sophomores until they have selected major advisers. The function of the underclass adviser is to assist the student in his choice of studies, to advise him during the term regarding his work, and to give him friendly counsel.

SPECIAL PROGRAMS

The facilities of this College are intended primarily for students interested in a liberal arts education, but are also available, by means of the following special programs, to students planning eventually to enter certain of the professions.

PREPARATION FOR TEACHING. Students planning to teach in the secondary school may combine the necessary professional preparation with other prescriptions of the College in satisfaction of the requirements for graduation. A fifth year of preparation is required for the permanent certificate in New York State.

Programs for such students have been arranged in English and Public Speaking, in Foreign Languages, in Social Studies, and in Science and Mathematics. Advice should be sought early regarding teaching opportunities in these subjects, combination of subjects usually required of teachers, choice of the major subject, and related matters.

Questions may be directed to Professor F. H. Stutz, Stone Hall, Ithaca, New York, and to members of the Advisory Committee representing the various fields of concentration. New students interested in teaching are requested to confer with Professor Stutz in their first term of residence. (See also the Announcement of the School of Education.)

PRE-MEDICAL STUDENTS. All pre-medical students are requested to report once each semester to the chairman of the Pre-Medical Advisory Board, Professor L. L. Barnes, Rockefeller 155.

Certain minimum admissions requirements are prescribed by all medical schools. Since the most substantial of these requirements is in the field of Chemistry, it is recommended that the freshman pre-medical student include Chemistry in his course of study. Some freshman pre-medical students choose to take two sciences; either Chemistry and Zoology or Chemistry and Physics. Students who plan to make Zoology their major subject will find it advantageous to include Zoology in their freshman programs.

Medical educators are quite generally agreed that when a pre-medical student is planning his college course, he should not allow his interest in science to exclude studies in the humanities. They also agree that it would be unfortunate for the future of medicine if all pre-medical students were to take the same pre-medical course, or major in the same subjects.

The Pre-Medical Advisory Board suggests the following first semester program: English 111 (three hours), French or German (six hours), or Latin (three hours); Chemistry (three hours). The remaining three to six hours should be chosen from the courses listed under Courses Open to Freshmen.

PRE-LEGAL STUDENTS. All pre-legal students are invited to consult with the members of the Law Faculty at any stage of their college course as to their election of subjects and in regard to any other matters pertinent to the legal career. Students taking the six-year combined Arts-Law course who are planning to enter the Law School upon completion of their work in this College, should also confer with the Secretary of the Law School not later than their sophomore year.

PRE-BUSINESS AND PUBLIC ADMINISTRATION. The School of Business and Public Administration will give predominant weight to the quality of an applicant's previous academic record rather than to the particular courses which he has taken. But students who plan to enter the School are urged to include in their undergraduate programs basic courses in Economics and American Government. Students who expect to concentrate in Accounting or Statistics should take as much work in Mathematics as is feasible. Students who intend to specialize in Public Administration should try to include a course in Constitutional Law in their undergraduate program prior to entering the School.

PREPARATION FOR NURSING. Students interested in nursing as a career will be assigned to Professor F. G. Marcham as adviser. A representative of the School of Nursing will come to the campus early in the first term for conferences with prospective applicants.

COMBINED PROGRAM IN FINE ARTS. Students interested in this course of study should consult Professor Waage at the time scheduled for consultation with advisers in the Orientation Period Program.

NUMBER OF HOURS

An "hour" ordinarily represents attendance once a week at lecture or recitation, or at a laboratory exercise lasting two hours and a half or three hours.

A freshman will usually register in his first term for fifteen hours of work, in addition to the required hours in Physical Training and Military Science (see pp. 118 and 120).

Every student must register in each term for at least twelve academic hours. Underclassmen may register for no more than seventeen academic hours, in any case for no more than five courses, except by permission of the Dean. No upperclassman may register for more than eighteen hours in any term except by permission of the Dean, which will normally be granted, on petition, only to students who have achieved an average grade of 80 or better in preceding work. In addition to the required work in Physical Training and Military Science, a student on probation may not register for more than fifteen academic hours a term.

COURSES OPEN TO FRESHMEN

See also "Prescribed Subjects and Proficiencies," pp. 17-20.

The following are the courses in the College of Arts and Sciences regularly open to freshmen, except that (1) a student may not register

for any course for which he has not satisfied the prerequisites, if any are specified (see announcement under each course); (2) a student may not register for any course for which he has presented an acceptable equivalent at entrance:

- | | |
|---|---|
| <p>Astronomy 101, 102, 125, 127
 Biology 1
 Botany 1
 Chemistry 101-102, 105-106, 111-112, 115
 Chinese 101, 102, 103, 201, 203 (Division of Modern Languages)
 Economics 101, 105
 English Language 101-102, 103, 201 (Division of Modern Languages)
 English 111-112
 The Fine Arts 101-102, Architecture 300
 French 101, 102, 103, 201, 203 (Division of Modern Languages)
 French Literature 301-302 (Department of Romance Literature)
 Geology 101-102, 105, 107-108, 111, 115
 German 101, 102, 103, 105, 201, 203 (Division of Modern Languages)
 German Literature 151-152, 315, and any other for which the student is linguistically prepared
 Government 101, 102, 104
 Greek 101, 103, 201, 203, 209-210 (Department of Classics)</p> | <p>History 101-102, 103-104, 108
 Italian 101, 102, 103, 201, 203 (Division of Modern Languages)
 Latin 105-106, 107, 109-110, 111-112, 115-116 (Department of Classics)
 Literature 101-102 (Division of Literature)
 Mathematics 121-122, 129, 131, 133, 171-172-173
 Music 101-102, 103-104, 401-402, 405-406
 Philosophy 101, 102, 103
 Physics 103, 104, 107, 108, 115
 Physiology 303
 Portuguese 101, 102, 103, 201, 203 (Division of Modern Languages)
 Psychology 101, 102
 Russian 101, 102, 103, 201, 203 (Division of Modern Languages)
 Sociology 101, 102, 103
 Spanish 101, 102, 103, 201, 203 (Division of Modern Languages)
 Spanish Literature 501-502 (Department of Romance Literature)
 Speech and Drama 131, 133
 Statistics 101
 Zoology 9, 101-102, 103-104</p> |
|---|---|

PREScribed SUBJECTS AND PROFICIENCIES

Before registering for his first term, each student must take a qualifying examination in arithmetic and the rudiments of algebra. Stu-

dents with advanced standing credit in mathematics may be excused from the examination. Those found deficient in elementary mathematical skills will be required to complete Mathematics 111, Basic Mathematics, a one-term course carrying one hour of credit; they must begin the course in the first term and must re-register each term until they pass. Mathematics 111 may not be offered toward fulfillment of Item 4 under Basic Information.

Before graduation each student must satisfy the following subject matter requirements:

A. *English*, by completing 111–112. This course must be begun in the first year of residence. Students demonstrating in class work and by examination a high level of accomplishment in English 111 may be exempted from English 112. Foreign students may satisfy the requirement by offering English Language 201 for which the prerequisite is satisfaction of the proficiency requirement as defined by the Division of Modern Languages.

B. *Foreign Language*. Each student must demonstrate proficiency in one foreign language, ancient or modern. In the ancient languages (Latin, Greek), the requirement may be met by the successful completion of Latin 110 or 112, or Greek 203. In the modern languages (Chinese, French, German, Italian, Portuguese, Russian, Spanish), the requirement may be fulfilled by passing a proficiency examination, to be administered at the beginning and at the end of each regular term.

In each modern language a sequence of two semester-courses is offered: course 101 (six credits), course 102 (six credits). No student is required to take these courses, since the requirement may be satisfied by passing the proficiency examination in the language. Well-prepared students will normally take the proficiency examination at entrance; by passing the examination they fulfill the requirement but receive no credit hours. Those who begin a new language, or one in which their preparation is slight, will ordinarily elect courses 101 and 102 in the language desired, and take the examination at the end of course 102. Those who have had a fair amount of preparation will, at entrance, take the proficiency examination, which will then serve as a placement test, indicating the level at which they may begin collegiate language study. A student who, having passed course 102, fails in the proficiency examination, may complete the requirement by passing course 103, or an equivalent. For further information see the announcement of the Division of Modern Languages, pp. 73.

A student who enters from a foreign country, and whose mother tongue is not English, will satisfy the modern foreign language requirement by demonstrating competence in English, which shall be defined for the purpose as a modern foreign language.

C. *Basic Information.* Each student must satisfy a requirement of six hours of credit by passing a course, or a college-credit examination equivalent to such a course, in each of the following groups. The courses approved for this requirement follow:

1. LABORATORY SCIENCE:

Astronomy 101, 102; or, for upperclassmen with sufficient preparation in Mathematics, any six hours in Interpretational Astronomy

Biology 1

Geology 101-102

Botany 1

Physics 103, 104; or the equivalent

Chemistry 101-102; 105-106

Zoology 101-102

2. HISTORY:

History 101 and 102; 103-104; 105 and 106; 107-108; 151 and 152

3. LITERATURE:

English 251-252; or 329-330

Far Eastern Studies 301-302; or 351-352

French Literature 301-302

German Literature 301-302, 310, 325, 345; or 365-366

Greek 201 and 203

Italian Literature 407-408

Latin 109-110 and 205; or 111-112 and 205

Literature 101-102; 201-202; 211-212; 301-302; or 311-312

Russian Literature. 301-302

Spanish Literature 501-502

He must also secure credit in a similar manner for a six-hour course in EACH of TWO of the following groups:

4. MATHEMATICS OR A SECOND SCIENCE:

Mathematics 121-122 or any six hours of more advanced courses

Science (a second science chosen from the list in Group 1 above; students who have chosen a *Physical Science* will take a *Biological Science*, and vice versa).

5. PHILOSOPHY:

Philosophy 101-102; 221-222; 225-226; or 321, 322

6. ECONOMICS OR GOVERNMENT:

Economics 101; or 105, 106

Government 101, and 102 or 104

7. PSYCHOLOGY OR SOCIOLOGY AND ANTHROPOLOGY:

Psychology 101-102

Sociology and Anthropology 101 and one of the following: 102, 103, 210, 228, 301, 431, or 601

8. FINE ARTS, MUSIC, OR SPEECH AND DRAMA:

Fine Arts 101-102

Music 101-102; or 301-302

Speech and Drama six hours chosen from courses 175, 401, 455, 475

Any student who was in residence in this College before July 1, 1946, may satisfy the requirements listed under PRESCRIBED SUBJECTS AND PROFICIENCIES by completing English 111-112; by fulfilling the requirement in a foreign language as specified above; and by passing six-hour courses in History and in a Laboratory Science.

With the permission of the department concerned, a freshman may take, at the end of the first term of a year-course, an additional credit examination covering the work of the second term. This provision applies not only to year-courses but also to such second-term courses as are natural continuations of first-term courses (e.g. Physics 104, following Physics 103). The privilege of receiving credit by such examinations is limited to students of high standing as defined by the department.

UPPERCLASSMEN**MAJOR SUBJECTS**

1) *Selection of major subject and adviser.* Before the end of the second year of residence, a student *must* select his major subject from options offered by the departments listed below. He must at the same time choose as his major adviser a designated representative of the department selected. During the remainder of his residence, he will consult with his major adviser in arranging his course and must obtain his signature on the study card before filing it in the Dean's office.

Astronomy	Division of Modern Languages
Botany	Division of Literature
Chemistry	Mathematics
The Classics	Music
Economics	Philosophy
English	Physics
Far Eastern Studies	Psychology
The Fine Arts	Romance Literature
Geology	Russian Literature
German Literature	Sociology and Anthropology
Government	Speech and Drama
History	Zoology

2) *Major Requirements.* Before graduation, a student must complete courses which satisfy the requirement in his major subject. A statement of this requirement, indicating courses and total hours required, appears before the list of courses in each of the departments. The student must also meet the stated requirement of courses in related subjects. No student may count toward the one hundred and twenty-hours required for graduation more than forty-eight hours in courses offered by a single department, with the following exceptions: the first six hours of intensive courses in Modern Languages, and the first twelve hours of non-intensive courses for beginners in Latin and Greek. If a comprehensive examination is included in the requirements of the major subject, this must be passed before graduation. Courses completed before the selection of the major subject, including those offered in satisfaction of the prescriptions of the College, may be accepted in fulfillment of these requirements.

Upon recommendation of the major adviser, the Dean may excuse a student registered simultaneously in this College and in another College of the University from not more than eighteen hours of his major requirements.

3) *Informal Study.* The major requirements in certain subjects may be satisfied in part by Informal Study. In those subjects in which Informal Study is arranged a statement to this effect appears before the list of courses. Departments may require Informal Study of some or all of their major students, or may admit them upon application.

Informal Study will consist of reading, reports, experimentation, senior theses, or other work intended to require from the student the expression of initiative in his major subject or in a related field approved by his adviser. This work will be supervised by the major adviser

or by a member of the instructing staff approved by him, and may be tested by examination at the option of the department.

A student who has sixty credit hours is eligible for Informal Study. He may earn credit by this means to the amount of six hours in the junior year, and of twelve in the senior year. A student desiring to do Informal Study outside his major department must secure the approval of the faculty member under whom he proposes to work and of his adviser; he will then submit a petition to the Dean.

ADMISSION TO ADVANCED STANDING

A student admitted to the College of Arts and Sciences from another College of Cornell University, or from any other institution of collegiate rank, including certain programs of study offered to members of the military services, will receive credit toward the degree of Bachelor of Arts for the number of hours to which his records may, in the judgment of the Faculty, entitle him. In order, however, to obtain the degree of Bachelor of Arts, he must, as a candidate for that degree, have been in residence at least two terms in the College of Arts and Sciences, and in that College only, and he must have completed a minimum of thirty hours while thus enrolled. Under present conditions only students with superior records may hope to be admitted with advanced standing, and preference is likely to be given to students with less than junior standing.

Credit toward a degree for work done in a preparatory school, upon subjects which may be offered for entrance to the University, may be given only to those students who, in addition to satisfying all entrance requirements, pass separate examinations in the subjects for which they seek college credit. Inquiry regarding such examinations should be addressed to the Office of Admissions, Administration Building.

To freshmen in the College of Arts and Sciences these college-credit examinations are open at the end of their first term as well as at entrance. Moreover, freshmen of this College may take college-credit examinations in subjects for which no entrance credits have been offered, provided they furnish the department concerned with evidence of preparation warranting an examination.

CREDIT FOR SUMMER SESSION

Credit for work done in summer sessions at Cornell or elsewhere may be granted to the extent of thirty hours. Applications for such credit

must be filed in the Dean's office prior to June 1, where they will be considered and acted upon in accordance with their merits.

DOUBLE REGISTRATION

A student who has completed at least ninety hours in courses given in the College of Arts and Sciences may, with the permission of the Faculties concerned, be registered both in the College of Arts and Sciences and in the Cornell University Medical College or the Cornell Law School or the School of Business and Public Administration. (See MAJOR SUBJECTS, 2, p. 21.) It should be noted, however, that admission to the Medical College is closely restricted, and that in recent years the Medical College has been able to grant this privilege of double registration to only a small proportion of the fourth-year students of the College of Arts and Sciences who applied and who were formally eligible for it.

A six-year combined course, leading to the A.B. and M.F.A. degrees, is offered by the Department of Fine Arts (see p. 55).

Consult also the italicized statements by the several Departments.

MARKS AND SCHOLASTIC DISCIPLINE

The passing grade is 60; the mark *abs.* represents a course left incomplete by a student's absence from the final examination; *inc.* represents a course left incomplete for other reasons acceptable to the instructor; Z, a course from which a student withdrew without an official cancellation.

No credit towards graduation will be given for a course in which a mark of less than 60 or in which one of Z is recorded, unless the course be repeated and a passing mark received. A student who has received a mark between 50 and 59, inclusive, in any course that is a prerequisite of any other course may, at the discretion of the department concerned, be regarded as having satisfied the prerequisite.

A student who, in any course, has received a term mark of *inc.* or of *abs.* may, with the consent of the Dean, and upon payment of the fee required by the University, be permitted to remove the mark, by examination or otherwise, as the department concerned may direct. A mark of incomplete or of absent may not be removed later than registration day of the third term of attendance in the University, dating from the time the course was taken, and no more than one attempt at removal will be allowed.

A student who in any term does not pass twelve hours (excluding courses in Military Science and Physical Training), with a grade of 70

or better in at least nine of the twelve hours, will be either dropped from the College or placed upon probation. The same penalties may be imposed on students of the College who, having registered in the Summer Session, do not pass a proportionate part of their Summer Session registration with satisfactory grades. Students on probation may not register in any Summer Session other than the Cornell Summer Session with the expectation of receiving credit in this College.

Students failing to make normal progress in fulfilling the requirements in Military Science and Physical Training will be given special warning or dismissed from the College.

A student's general record may be so unsatisfactory that the Faculty will refuse him permission to continue in the College even though he has passed twelve hours in the preceding term.

A student failing in the last term, or Summer Session, of his senior year to meet the requirements in hours and grades described above, will ordinarily be expected to return for another Summer Session wherein he will be required to make a satisfactory record before he will be graduated.

REQUIREMENTS FOR GRADUATION

The College of Arts and Sciences offers one degree only, the Bachelor of Arts. This degree will not be conferred upon any student who has not been in residence at Cornell during the last two terms preceding graduation, and registered in the College of Arts and Sciences, nor upon any student who has not been in residence during at least two terms in the College of Arts and Sciences and in this College only.

THE DEGREE OF BACHELOR OF ARTS

A candidate must meet the following requirements for the degree of Bachelor of Arts:

1. Credit for one hundred and twenty hours, of which at least ninety hours must be for courses given in the College of Arts and Sciences. Elementary courses in Military Science and Tactics and Physical Training, which are offered under the jurisdiction of the University, but not of any College, *may not* be counted as part of the thirty hours which a student may elect outside the College of Arts and Sciences, nor as part of the ninety hours required in the College. However, advanced courses in Military Science and Tactics *may* be counted in the thirty hours allowed outside this College, to a maximum of twelve hours (see page 119). Certain courses in Naval Science and Tactics are also open to

civilian students in the College of Arts and Sciences who secure permission to register from the Professor of Naval Science and Tactics. For a statement of the credit carried by these courses see p. 120.

2. A grade of 70 or better in at least seventy-two of the required one hundred and twenty hours. At least one half of the major requirements, including related subjects (see p. 21), must be passed with grades of 70 or better.

3. Election of courses in accordance with **PRESCRIBED SUBJECTS AND PROFICIENCIES**, pp. 17-20.

4. Completion of the work in Military Science and Physical Training as prescribed by the University Faculty (see pp. 118 and 120).

BACHELOR OF ARTS WITH DISTINCTION

The degree of Bachelor of Arts with Distinction in the field of a student's major subject will be conferred upon those students who, in addition to having completed the requirements for the degree of Bachelor of Arts, shall (1) have received a grade of 85 or better in at least sixty hours of the courses for which they have been enrolled, and an average of 85 in the courses for which they have been enrolled in the field of their major subject and its related courses; (2) have, at the option of the department, taken and passed with distinction a comprehensive examination in the major subject; (3) have been recommended for the said degree by the department representing their major subject.

The degree of Bachelor of Arts with Distinction in all subjects will be conferred upon those students who, in addition to having completed the requirements for the degree of Bachelor of Arts, shall (1) have received the grade of 80 or better in at least ninety hours of courses, and of 90 or better in at least sixty of these; (2) not have received a grade below 70 in more than one course; (3) have received no marks lower than 60. To qualify for the degree of Bachelor of Arts with Distinction in all subjects, a candidate must have completed at least sixty hours at Cornell in courses taught in the College of Arts and Sciences; and if he has received credit towards his degree for work done in another institution, the requirement of grades shall be prorated for the residue of work which must be completed in Arts and Sciences at Cornell.

SCHOLARSHIPS AND PRIZES

Scholarships and prizes open to students of Arts and Sciences as members of the University are listed in the *General Information* circular,

Announcement of Prize Competitions, and the Announcement of Scholarships and Grants-in-Aid. Only students of Arts and Sciences are eligible for the scholarships and prizes described here.

THE GEORGE C. BOLDT MEMORIAL SCHOLARSHIPS

Mr. George C. Boldt, Jr., has created three scholarships, each of them worth four hundred dollars, as a memorial to his father. These scholarships will be awarded at the close of the junior year to the three men students of the College who shall be considered most deserving of this aid. Applications for these scholarships must be filed in the Office of the Dean before March 15 of the academic year preceding the year for which they are awarded. Students enrolled both in this College and in the Law School, the Medical College, or the Graduate School are not eligible.

CHESTER BUCHANAN MEMORIAL SCHOLARSHIP

A gift of Mrs. Claire F. Buchanan, in memory of her son, Chester Buchanan, carries an annual stipend of sixty dollars. It is awarded each year on the recommendation of the Department of Geology to the outstanding male senior who is majoring in this subject.

THE CORNELIA L. HALL SCHOLARSHIP

A gift of the late Mary F. Hall has established the Cornelia L. Hall Scholarship, worth one hundred and twenty dollars, "open to any meritorious young woman of this State, who is pursuing the studies of the A.B. course and who is in need of financial assistance." Under the terms of the bequest, preference must be given to a suitable candidate from Tioga, Tompkins, or Chemung County; within this preferred class, women of senior or junior standing will be regarded as entitled to first consideration. Applications for the scholarship must be filed in the Office of the Dean before March 15 of the academic year preceding the year for which it is awarded.

KENNETH O. REED MEMORIAL SCHOLARSHIP

The Kenneth O. Reed Memorial Scholarship was established by Professor and Mrs. Harold L. Reed in memory of their son, Lieutenant Kenneth O. Reed, Cornell 1941. The sum of seven hundred and twenty dollars will be made available annually. The scholarship will be awarded on the basis of qualifications of character, personality, and habit, as well as intellectual accomplishment and promise, to a junior or senior in the College who is a graduate of Ithaca High School. Prefer-

ence will be given to students majoring in the social studies. In the event there is no acceptable applicant among juniors and seniors the scholarship may be awarded to a freshman or a sophomore in the College of Arts and Sciences who has indicated his intention of majoring in one of the social subjects.

Application should be filed with the Counselor of Students prior to May 1 of the academic year preceding the year for which the scholarship is awarded.

THE GEORGE CHAPMAN CALDWELL PRIZE

The George Chapman Caldwell Prize of fifty dollars, established in 1913, is awarded by the Staff of the Department of Chemistry to a member of the senior class in Arts with a major in Chemistry for general excellence in Chemistry.

THE BESS BERLOW COHAN PRIZE

The Bess Berlow Cohan Prize of one hundred dollars, established in 1939, is awarded by a committee to the member of the senior class who has shown the greatest ability and progress in a combined study of Classics and English.

THE JULIETTE MACMONNIES COURANT PRIZE

The Juliette MacMonnies Courant Prize, founded by Mrs. Margaret MacMonnies Courant in memory of her daughter, consists of about forty dollars, either in cash or books as the recipient may determine. It is awarded annually to that woman student of the senior class whose major subject is French and who shall, in the opinion of the committee of award, have made the best record in her four years of work, with especial reference to facility of expression in French.

THE DEAN'S PRIZE

The Dean's Prize of seventy-five dollars will be awarded to that student in Literature 101-102 who, in the opinion of those in charge of the course, shall have done outstanding work in the course.

THE DUNIWAY PRIZE

The Duniway Prize, founded by a bequest of the late Clyde A. Duniway, will be awarded annually to the best senior majoring in History or in Government and shall consist of books in the fields of History and Government to the value of approximately thirty dollars. In selecting the winning candidate, the committee of award shall take

into account his academic record, his ability to express himself clearly and idiomatically in speaking and writing, and his scholarly approach.

THE HAROLD ADLARD LOVENBERG PRIZE

The Harold Adlard Lovenberg Prize of forty dollars, established in 1939, is awarded by the Staff of the Department of Chemistry to a member of the junior class in Arts with a major in Chemistry, for general excellence.

COURSES OF INSTRUCTION

The following list of courses will be offered in the academic year 1948-1949. Courses numbered from 100 to 200 are, in general, introductory, and may not be offered, save when so specified by the departments concerned, in partial satisfaction of major requirements. Branches or divisions of a subject are usually indicated through use of the hundreds place digit from 2 to 9 inclusive. Courses primarily for graduates, but open to undergraduates under certain conditions, bear numbers 75 or larger—Geology 395-396, Philosophy 575-576, etc. A table showing the correspondence of the new course numbers in this Announcement with the equivalent course numbers in Announcements prior to 1947 will be found on pp. 122. The student should read carefully the italicized statements preceding the offerings of each department and division in which he selects courses.

A list of rooms in which all lectures, recitations, and laboratory exercises are to be held will be distributed before the commencement of instruction.

ASTRONOMY

Mr. R. W. SHAW, *Chairman*; Miss M. E. STAHR.

For a major in Astronomy the following courses must be completed: (1) in Astronomy, courses 101, 102, 128, or 182, six hours of Interpretational Astronomy, six hours of Observational Astronomy, six hours of electives; (2) in related subjects, at least fifteen hours selected from approved courses in Chemistry, Geology, Mathematics, and Physics.

101. *INTRODUCTION TO ASTRONOMY*. Fall term. Credit three hours. Lectures, T Th 11. Laboratory, M T W or Th 2-4. Mr. SHAW.

Fundamentals of astronomy with emphasis on the Planets, Moon, Comets, Meteors, the Solar System as a unit, and Telescopes. Observation at Fuertes Observatory.

102. *INTRODUCTION TO ASTRONOMY*. Spring term. Credit three hours. Lectures, M T Th 11. Laboratory, T W or Th 2-4. Mr. SHAW.

Fundamentals of astronomy with emphasis on the Sun, the Stars, the Galaxy, the Sidereal Universe, and Spectroscopy. Observation at Fuertes Observatory.

[125. *AIR NAVIGATION*. Fall term. Credit three hours. Mr. SHAW. Not offered in 1948-1949.]

[127. *NAVIGATION AND NAUTICAL ASTRONOMY I*. Fall term. Credit three hours. Prerequisite, Elements of Plane Trigonometry. Hours to be arranged. STAFF. Not offered in 1948-1949.]

128. *NAVIGATION AND NAUTICAL NAVIGATION II*. Spring term. Credit three hours. Prerequisite, Elements of Plane Trigonometry. M W F 11. Mr. SHAW.

Celestial navigation. Theory of position determination by H.O. 211, H.O. 214, H.O. 218, and Star Altitude Curves. Practice with marine, standard bubble, and automatic sextants. Chart work and radio navigation.

INTERPRETATIONAL ASTRONOMY

[221. *ORIGIN OF THE SOLAR SYSTEM*. Fall term. Credit three hours. Mr. SHAW. Not offered in 1948-1949.]

[226. *THEORY OF ORBITS*. Spring term. Credit three hours. Miss STAHR. Not offered in 1948-1949.]

[231. *STELLAR INTERIORS*. Fall term. Credit three hours. STAFF. Not offered in 1948-1949.]

238. *ASTROCHEMISTRY*. Fall term. Credit three hours. Prerequisite, the calculus. M W F 11. Mr. SHAW.

Chemical and physical structure of all types of celestial objects. Behavior of matter under extremes of temperature and pressure. Formation of special lines and the quantitative analysis of stellar atmospheres. Formation of molecules in planets, stars, comets, and interstellar space. Molecular aggregates. Atomic transformations and the origin of the elements.

241. *THE GALAXY*. Fall term. Credit three hours. Prerequisite, the calculus. M W F 12. Miss STAHR.

A study of the Milky Way, its components, dimensions, age, internal motion, and relation to the Universe. Critical consideration of the observations which are the source of our information. Application of statistical mathematics to astronomical problems.

244. *EXTERNAL GALAXIES*. Spring term. Credit three hours. Prerequisite, the calculus. M W F 12. Miss STAHR.

A study of the forms, components, distances, and distribution of the extra-galactic stellar systems. Our knowledge of the Magellanic Clouds, the neighboring systems, the metagalaxy, and the expanding universe from modern investigations.

259. *SPECIAL TOPICS IN ASTRONOMY*. Fall term. Repeated in the spring term. Credit one to three hours. Hours to be arranged. STAFF.

Qualified students may receive instruction in special topics selected according to their needs and preparation.

OBSERVATIONAL ASTRONOMY

[461. *ASTRONOMICAL SPECTROSCOPY*. Fall term. Credit three hours. Mr. SHAW. Not offered in 1948-1949.]

[464. *ASTROMETRY*. Spring term. Credit three hours. Miss STAHR. Not offered in 1948-1949.]

[466. *ASTRONOMICAL PHOTOMETRY*. Spring term. Credit three hours. STAFF. Not offered in 1948-1949.]

182. *FIELD ASTRONOMY*. Spring term. Credit two hours. One lecture and one afternoon or evening observation period to be arranged. Prerequisite, Plane Trigonometry. Mr. SHAW.

Basic theory and practice in the determination of Latitude, Longitude, Time, and the Azimuth of a Line. Practice with the surveyor's transit, the sextant, and the theodolite. Fundamentals of spherical trigonometry will be included in the course.

BOTANY

Mr. LEWIS KNUDSON, *Chairman*; Messrs. D. G. CLARK, R. T. CLAUSEN, O. F. CURTIS, A. J. EAMES, M. F. MOSELEY, W. C. MUENSCHER, L. C. PETRY, L. F. RANDOLPH, C. H. UHL.

For a major in Botany the student must complete courses 1 and 117 and two of the following courses: 31, 123, 124 and 126, and in addition one course of three or four hours' credit in the field of Botany. In related subjects eighteen hours must be selected from approved courses in Bacteriology, Biochemistry, Chemistry, Entomology, Geology, Physics, Plant Pathology, and Zoology. The course in genetics may be offered either as a course in Botany or in the related subjects.

For a major in Botany with advanced work in Bacteriology, the following courses must be completed: (1) in Botany, courses 1, 31, 117; in Bacteriology, eight hours of advanced courses approved by the Department of Botany; (2) in related subjects, eighteen hours to be selected from the list given in the paragraph above.

Provisions are made for a limited number of students to undertake Informal Study.

1. **GENERAL BOTANY.** Throughout the year. Credit three hours a term. If taken after Biology 1, credit two hours a term. Lectures, T Th 9 or 11. Laboratory, M T W Th or F 2-4:30; and some morning sections to be arranged. Mr. PETRY and instructors.

A survey of the fundamental facts and principles of plant life. The work of the first term deals with the structures and functions of the higher plants, with special emphasis on their nutrition. The work of the second term traces the evolution of the plant kingdom, as illustrated by representatives of the principal groups, and concludes with a brief introduction to the principles of classification of the flowering plants.

31. **PLANT PHYSIOLOGY.** Either term. Credit four hours. Prerequisite, Botany 1, or Biology, and Introductory Chemistry. Lectures, T Th 10. Laboratory, T Th W F 2-4:30 or M 2-4:30, S 8-10:30. Messrs. KNUDSON, CURTIS and CLARK.

This course is designed to acquaint the student with the general principles of plant physiology. Topics such as water relations, photosynthesis, translocation, digestion, respiration, mineral nutrition, growth, and reproduction are studied in detail. Particular emphasis is placed, both in laboratory and in classroom, on discussion of principles and their application to plants.

55. **WEEDS AND POISONOUS PLANTS.** Fall term. Credit three hours. Prerequisite, Botany 1, or its equivalent. Lectures, F 8. Laboratory, W F 2-4:30. Mr. MUENSCHER and assistant.

Special emphasis is given to the habits, characteristics, and properties which make weeds and poisonous plants harmful or undesirable, the losses and injury produced by them, and the methods for their prevention, eradication, and control.

56. **SEED ANALYSIS.** Spring term. Credit one hour. Prerequisite, Botany 1, or its equivalent. Lectures and laboratory, F 2-4:30. Mr. MUENSCHER and assistant.

A course designed for students in the applied plant-science departments and those

interested in preparing to be seed analysts. Practice is given in making purity analyses and germination tests according to standard and official methods and recommendations.

115. *AQUATIC PLANTS*. Spring term. Credit three hours. Prerequisite, Botany 1, or its equivalent. Lecture, M 9, Laboratory M W 2-4:30, Plant Science 353. Mr. MUENSCHER.

A study of the taxonomy and ecology of fresh-water plants, beginning with the algae and concluding with the aquatic angiosperms.

117. *TAXONOMY OF VASCULAR PLANTS*. Fall term. Credit four hours. Prerequisite, course 1 or its equivalent. Lectures, T Th 9. Plant Science 143. Laboratory, T Th 2-4:30. Plant Science 211. Mr. CLAUSEN.

A survey of the families of ferns, gymnosperms, and dicotyledons, their gross morphology, geographical distribution, and economic importance. Methods of identification are stressed. In the early part of the term, several trips will be scheduled during laboratory periods. Courses 117 and 118 are planned as a unit, though either course may be taken alone providing that the prerequisites are fulfilled.

[118. *TAXONOMY OF VASCULAR PLANTS*. Advanced course. Spring term. Credit four hours. Prerequisite, course 117 and either course 124 or Plant Breeding 101. Lectures T Th 9. Plant Science 143. Laboratory, T Th 2-4:30. Plant Science 211. Mr. CLAUSEN.

A continuation of course 117, including a consideration of the families of monocotyledons; a study of variation, natural selection, isolating mechanisms, hybridity and modes of reproduction in relation to taxonomy; and a brief survey of the vegetation of North America. Attention is also given to the literature of the subject and to taxonomic methods. The laboratory periods afford opportunity for a detailed study of the spring flora of the Cayuga region. Not offered in 1948-1949.]

COMPARATIVE MORPHOLOGY OF FUNGI. Offered by the Department of Plant Pathology.

123. *PLANT ANATOMY*. Fall term. Credit four hours. Prerequisite, Botany 1, or its equivalent, and consent of the instructor. Lecture and laboratory, T 9-12:30 and Th S 9-11:30. Mr. EAMES.

This course is designed to give a working acquaintance with the internal morphology of vascular plants, and emphasis is placed on practice in interpretation and determination of material. The course is planned primarily for students in applied fields of botany, such as pathology, pomology, or genetics. Students desiring a less detailed training in this subject should take Botany 126.

124. *CYTOLOGY*. Fall term. Credit four hours. Prerequisite, Botany 1, or Zoology 101-102 or its equivalent. Lectures, M W 9. Laboratory, M W or T Th 10-12:30. Assignment to laboratory section must be made at time of registration. Mr. UHL.

The principal topics considered are protoplasm, cells and their components, nuclear and cell division, meiosis and fertilization, and the relation of these to the problems of development, reproduction, taxonomy, and heredity. Both plant and animal materials are used. Microtechnic is not included.

126. *MORPHOLOGY OF VASCULAR PLANTS*. Throughout the year. First term is prerequisite to second. Credit three hours a term. Prerequisite, Botany 1 or its equivalent, and consent of the instructor. Lecture, F 9. Laboratory, W 9-12:30 and F 10-11:30. Mr. EAMES and Mr. MOSELEY.

An advanced course in the comparative morphology, life histories, and phylogeny of vascular plants.

171. *SPECIAL PROBLEMS IN GENERAL BOTANY, TAXONOMY, MORPHOLOGY, ANATOMY, PALEOBOTANY, ECONOMIC BOTANY, CYTOLOGY, AND PHYSIOLOGY.* Throughout the year. Credit not less than two hours a term. Hours by appointment.

Students engaged in special problems or making special studies may register in this course. They must satisfy the instructor under whom the work is taken that their preparation warrants their choice of problem.

224. *CYTOGENETICS.* Spring term. Credit three hours. Prerequisites, Botany 124, Plant Breeding 101, and permission to register. Lectures, M W 9. Laboratory, M or W 10-12:30.

An advanced course dealing mainly with the chromosome mechanism of heredity and with recent researches in cytology, cytotaxonomy, and cytogenetics. Mr. RANDOLPH.

231. *PLANT PHYSIOLOGY, ADVANCED LECTURE COURSE.* Throughout the year. Credit three hours a term. Limited to seniors and graduate students. Prerequisite, training in Botany and Chemistry, to be determined in each case by the Department. Lectures, M W F 10. Mr. KNUDSON and Mr. CURTIS.

232. *PLANT PHYSIOLOGY, ADVANCED LABORATORY COURSE.* Throughout the year. Credit three hours a term. Prerequisite or parallel, Botany 231. Laboratory, M 2-4:30 and S 8-12:30. Messrs. KNUDSON, CURTIS, and CLARK.

234. *PLANT PHYSIOLOGY.* Advanced lecture course. Fall term. Credit one hour. Prerequisite, plant physiology 231, or adequate preparation in Botany and Chemistry. T 4:15-5:00. Plant Science 143. Mr. K. C. HAMNER.

This course will deal primarily with physiology in relation to hormones, photoperiodism, and vernalization.

CHEMISTRY

Mr. PETER DEBYE, *Chairman*; Messrs. SIMON H. BAUER, ALFRED T. BLOMQUIST, THOMAS R. BRIGGS, CORNELIUS K. CAIN, DE LOS F. DETAR, JAMES L. HOARD, JOHN R. JOHNSON, ALBERT W. LAUBENGAYER, FRANKLIN A. LONG, WILLIAM T. MILLER, EARL E. MUSCHLITZ, MELVIN L. NICHOLS, JACOB PAPISH, HARVEY W. POSVIC, RICHARD A. REINHARDT, HAROLD A. SCHERAGA, MICHELL J. SIENKO, ERVIN R. VAN ARTSDALEN, LLOYD A. WOOD.

All courses listed below, except Chemistry 220 and 307 (Fall term) and 308 (Spring term), will be given in the Baker Laboratory of Chemistry.

For a major in Chemistry the following Courses must be completed: (1) in Chemistry, courses 105-106, 201, or 205 and 207; or, preferably 111-112, 115, and 212; 215, or 220 and 222; 307-308, 311; 407-408, 411; and six hours of electives; (2) in related subjects, Mathematics 155-156; or 171-172-173; Physics 103 and 104; or 107 and 108; German 101, unless two units have been offered for entrance.

INORGANIC CHEMISTRY

Students exceptionally well prepared in chemistry should read the section on p. 22 in regard to college-credit examinations.

101-102. *GENERAL CHEMISTRY*. Throughout the year. Credit three hours a term. Chemistry 101 is prerequisite to Chemistry 102. A terminal course for those students who do not intend to take more chemistry. Will not serve as prerequisite for more advanced courses in chemistry. Secondary school chemistry is not prerequisite. Lectures, Fall term: M F 10 or 12. Spring term: M F 10 or 11. Laboratory, M T W Th or F 8-11, 10-1, or 1:40-4:30, or S 8-11. Conference, one hour a week, to be arranged. Mr. WOOD, Mr. POSVIC and assistants.

Emphasis on the more important chemical principles and facts, on the scientific method, and on the relation of chemistry to the other fields of knowledge and to everyday life.

105-106. *GENERAL CHEMISTRY*. Throughout the year. Credit three hours a term. Chemistry 105 is prerequisite to Chemistry 106. For those students who will take more chemistry, and serving as a prerequisite to the more advanced courses in chemistry. Secondary school chemistry is not prerequisite. May be elected by students who do not intend to take more chemistry. Lectures, T Th 10, 12, or 3. Laboratory, M T W Th or F 8-11, 10-1, or 1:40-4:30, or S 8-11. Conference, one hour a week, to be arranged. Mr. VAN ARTSDALEN, Mr. REINHARDT, and assistants.

The important chemical principles and facts will be covered, with considerable attention given to the quantitative aspects and to the technics which are important for further work in chemistry.

111-112. *INTRODUCTORY INORGANIC CHEMISTRY*. Throughout the year. Credit, Chemistry 111 three hours, Chemistry 112 two hours. Chemistry 111 is prerequisite to Chemistry 112. Chemistry 115 must be taken with Chemistry 111, except by consent of the instructor. Open to those students who have offered high school chemistry for entrance. Required of candidates for the degree of B. Chem. Eng. and recommended for candidates for the degree of A.B. with a major in Chemistry. Lectures, Fall term, M W F 8; Spring term, W F 8. Mr. LAUBENGAYER and Mr. SIENKO.

115. *INTRODUCTORY INORGANIC LABORATORY*. Fall term. Credit three hours. Must be taken with Chemistry 111. Laboratory, T Th 8-11, W F 10-1, or S 8-1. Conference, one hour a week to be arranged. Mr. LAUBENGAYER, Mr. SIENKO, and assistants.

575-576. *ADVANCED INORGANIC CHEMISTRY*. Throughout the year. Credit three hours a term. Prerequisite or parallel courses, Chemistry 403-404, or 407-408, or consent of the instructor. Open to upperclassmen and graduate students. Lectures, M W F 11. Mr. LAUBENGAYER.

The development of theories of atomic structure, the classification of the elements, and the nature of chemical bonding are considered. The elements are discussed in the order of the Periodic System, with special attention to the bearing of atomic structure on the properties of the elements and their compounds and on the relations between the groups and periods. The less familiar elements are treated in detail and the stereo-chemistry of inorganic substances is emphasized.

580. *ADVANCED INORGANIC LABORATORY*. Either term. Credit two to six hours. Prerequisite, Chemistry 307-308 and 311 and 312, and consent of the in-

structor. Chemistry 580 is designed to accompany Chemistry 575-576 but may be taken separately. Hours to be arranged. Mr. LAUBENGAYER and Mr. VAN ARTS-DALEN.

Laboratory practice. The preparation, purification, properties, and reactions of inorganic compounds, including those of the rarer elements.

585-586. *SELECTED TOPICS IN ADVANCED INORGANIC CHEMISTRY*. Throughout the year. Credit two hours a term. Prerequisite, Chemistry 403-404, or 407-408, and 411-412, or consent of the instructor.

Topics and instructor to be announced.

[590. *CHEMISTRY OF THE RARE ELEMENTS*. Either term. Credit two or more hours. Prerequisite, Chemistry 575-576. Hours to be arranged. Mr. PAPISH.

Laboratory practice. Extraction, recovery, and purification of the rare elements, and preparation of their salts. Chemical analysis of the rare elements. Not offered in 1948-1949.]

ANALYTICAL CHEMISTRY

201. *INTRODUCTORY QUALITATIVE ANALYSIS*. Short course. Either term. Credit three hours. Prerequisite, Chemistry 105-106, or 111 and 115. Enrollment may be limited, especially in the spring term. Lecture, W 12. Laboratory, T Th 8-11 or T Th 1:40-4:30 (fall term only). Mr. BAUER, Mr. LONG, and assistants.

A study of the properties and reactions of the common elements and acid radicals, and their detection in various solutions and solids.

205. *INTRODUCTORY QUALITATIVE ANALYSIS*. Fall term. Credit three hours. Prerequisite, Chemistry 105-106, or 111-112 and 115. Chemistry 207 must be taken with Chemistry 205. Lectures, M W F 9. Mr. BAUER, Mr. LONG, and assistants.

A study of the application of the theories of general chemistry to the systematic separation and detection of the common elements and acid radicals.

207. *INTRODUCTORY QUALITATIVE LABORATORY*. Fall term. Credit three hours. Prerequisite, Chemistry 105-106, or 111-112 and 115. Must be taken with Chemistry 205. Laboratory, M W F 1:40-4:30. Mr. BAUER, Mr. LONG, and assistants.

A study of the properties and reactions of the common elements and acid radicals, and their detection in various solutions and solids.

212. *INTRODUCTORY QUALITATIVE ANALYSIS*. Spring term. Credit five hours. Prerequisite, Chemistry 111 and 115. Must be taken with Chemistry 112. Required of candidates for the degree of B. Chem. Eng. and recommended for candidates for the degree of A.B. with a major in Chemistry. Lectures, M S 8. Recitation, one hour a week, to be arranged. Laboratory, T Th or W F 1:40-4:30. Mr. BAUER, Mr. LONG, and assistants.

A study of the application of the theories of general chemistry, and the properties and reactions of the common elements and acid radicals to their systematic separation and detection, and their detection in various solutions and solids.

215. *INTRODUCTORY QUANTITATIVE ANALYSIS*. Short course. Either term. Credit four hours. Prerequisite, Chemistry 201, or 205 and 207, or 212. Lectures, M W 12. Laboratory, M W or T Th 2-4:30, or T Th 8-10:30 (spring term only). Mr. NICHOLS, Mr. SCHERAGA, and assistants.

A study of the fundamental principles of gravimetric and volumetric analysis, and the analysis of various substances by these methods.

220. *INTRODUCTORY QUANTITATIVE ANALYSIS*. Either term. Credit three hours. Prerequisite, Chemistry 201, 205 and 207, or 212. Chemistry 222 must be taken with Chemistry 220. Required of candidates for the degree of B. Chem. Eng. and recommended for candidates for the degree of A.B. with a major in Chemistry. Lectures, M W 10. Recitation, one hour a week, to be arranged. Mr. NICHOLS, Mr. SCHERAGA, and assistants.

A study of the fundamental principles of gravimetric and volumetric analysis with practice in stoichiometry.

222. *INTRODUCTORY QUANTITATIVE LABORATORY*. Either term. Credit three hours. Prerequisite, Chemistry 201, 205 and 207, or 212. Must be taken with Chemistry 220. Required of candidates for the degree of B. Chem. Eng. and recommended for candidates for the degree of A.B. with a major in Chemistry. Laboratory, T Th 9-12:30 (fall term only) or F 2-4:30 and S 8-12:30. Mr. NICHOLS, Mr. SCHERAGA, and assistants.

Laboratory practice in the preparation and standardization of various volumetric solutions and the analysis of a variety of substances by volumetric and gravimetric methods.

240. *SPECIAL METHODS OF QUANTITATIVE ANALYSIS*. Either term. Credit three hours. Prerequisite, Chemistry 220 and 222, or consent of the instructor. Primarily for candidates for the degree of B. Chem. Eng. Lecture, T 11. Laboratory, M T or Th F 2-4:30, or W 2-4:30 and Th 10-12:30. Mr. NICHOLS and assistants.

The complete analysis of coal gas, the analysis of coal, the determination of the heating value of gaseous and solid fuels, and gas evolution methods. The application of instrumental methods to quantitative analysis including nephelometric, refractometric, colorimetric, electrolytic, combustion, conductometric, and potentiometric methods.

[250. *GAS AND FUEL ANALYSIS*. Fall term. Credit three hours. Prerequisite, Chemistry 220 and 222, or consent of the instructor. Mr. NICHOLS and assistants. Not offered in 1948-1949.]

265. *ADVANCED QUANTITATIVE LABORATORY*. Spring term. Credit three hours. Prerequisite, Chemistry 215 or 220 and 222. Conferences, one hour a week, to be arranged. Laboratory, M T W Th or F 2-4:30. Students should register for a combination of laboratory periods that will total seven and one half hours a week. Mr. NICHOLS and assistants.

Laboratory practice in the application of special methods of quantitative analysis and the analysis of special materials.

275. *QUANTITATIVE MICROANALYSIS*. Fall term. Credit three or more hours. Prerequisite, consent of the instructor. Primarily for graduate students. Enrollment is limited. Laboratory, W F 9-5. Mr. NICHOLS and assistant.

Laboratory practice in typical methods of both organic and inorganic quantitative microanalysis.

280. *EMISSION SPECTROSCOPY IN CHEMICAL ANALYSIS*. Either term. Credit three hours. Prerequisite, consent of the instructor. Primarily for seniors and graduate students. Conference, one hour a week, to be arranged. Laboratory, hours to be arranged. Mr. PAPISH and assistant.

The construction and use of spectroscopic equipment; spectrum excitation; qualitative and quantitative spectrochemical analysis.

285. *SPECTROCHEMICAL ANALYSIS*. Either term. Credit two or more hours. Prerequisite, Chemistry 280. Laboratory, hours to be arranged. Mr. PAPISH and assistant.

A continuation of Chemistry 280, as well as a study of the elements of absorption spectroscopy in chemical analysis.

290. *ADVANCED QUANTITATIVE ANALYSIS*. Spring term. Credit two hours. Prerequisite, Chemistry 403, or 407. Primarily for graduate students. Lectures, two hours a week to be arranged. Mr. NICHOLS.

A discussion of selected topics in quantitative analysis, and the development and present status of various analytical methods. Given in alternate years.

ORGANIC CHEMISTRY

301. *INTRODUCTION TO ORGANIC CHEMISTRY*. Fall term. Credit two hours. Prerequisite, Chemistry 105-106. For students in Engineering. Lectures, Th S 11. Mr. BLOMQUIST.

A brief survey of the principal classes of organic compounds, their industrial sources, manufacture, and utilization.

303. *ELEMENTARY ORGANIC CHEMISTRY*. Either term. Credit four hours. Prerequisite, Chemistry 105-106. Chemistry 201 is desirable but not required. Chemistry 305 must be taken with Chemistry 303. Primarily for students in the pre-medical and biological curricula. Lectures, M W F S 11. Mr. CAIN.

A study of aliphatic and aromatic organic compounds, their occurrence, relations, and uses.

The student should determine the entrance requirement in organic chemistry for the particular medical school he wishes to enter. Students may obtain nine hours credit by taking Chemistry 307-308 (six hours) and Chemistry 311 (three hours).

305. *ELEMENTARY ORGANIC LABORATORY*. Either term. Credit two hours. Must be taken with Chemistry 303. Laboratory, M W or T Th 2-4:30. Mr. CAIN and assistants.

Laboratory experiments on the preparation and reactions of typical organic compounds.

307-308. *INTRODUCTORY ORGANIC CHEMISTRY*. Throughout the year. Credit three hours a term. Prerequisite, Chemistry 201, 205 and 207, or 212. Open to those who are taking Chemistry 215 or 220 and 222. Chemistry 311 must be taken with Chemistry 307. Required of candidates for the degrees of B. Chem. Eng. and A.B. with a major in Chemistry, and recommended for pre-medical students who desire the longer course. Students who have completed Chemistry 303 and 305 may register for Chemistry 308 and receive two hours credit. (See Chemistry 303 and 305). Lectures, M W F 9. Mr. BLOMQUIST and Mr. JOHNSON.

A study of the more important compounds of carbon, their occurrence, methods of preparation, relations, and uses.

311. *INTRODUCTORY ORGANIC LABORATORY*. Fall term. Credit three hours. Must be taken with Chemistry 307. Required of candidates for the degrees of B. Chem. Eng. and A.B. with a major in chemistry, and recommended for pre-medical students who desire the longer course. (See Chemistry 303 and 305.) Laboratory, T Th 9-12:30, T Th 1-4:30, or F 2-4:30 and S 8-12:30. Mr. DETAR and assistants.

The student prepares typical compounds of carbon and familiarizes himself with their properties, reactions, and relations.

312. *INTERMEDIATE ORGANIC LABORATORY*. Spring term. Credit three hours. Prerequisite, Chemistry 311, parallel course Chemistry 308. Required of candidates for the degree of B. Chem. Eng., and recommended for candidates for the degree of A.B. with a major in Chemistry and pre-medical students who desire the longer course. (See Chemistry 303 and 305). Laboratory, T Th 9-12:30, T Th 1-4:30, or F 2-4:30 and S 8-12:30. Mr. DETAR, Mr. MILLER, and assistants.

A continuation of Chemistry 311.

320. *IDENTIFICATION OF ORGANIC COMPOUNDS*. Either term. Credit four hours. Prerequisite, Chemistry 307-308 and 311-312, at grades of 75 or better. Primarily for students contemplating advanced work in organic chemistry or related fields. Lectures, T Th 8. Laboratory, M W or T Th 2-4:30, or F 2-4:30 and S 10-12:30. Mr. MILLER and assistants.

The classification reactions of organic compounds and the preparation of solid derivatives are applied to the identification of unknown organic substances.

330. *ADVANCED ORGANIC LABORATORY*. Either term. Credit two to four hours. Prerequisite, Chemistry 312 and 320, and consent of the instructor. Primarily for seniors and graduate students as preparation for advanced and independent work. Enrollment limited for undergraduates to those having a record of 80 or better in prerequisite courses. Laboratory, hours to be arranged. Messrs. BLOMQUIST, CAIN, DETAR, JOHNSON, and MILLER.

An advanced course in organic synthetic procedures, involving preparation of intermediates for organic research and use of standard reference works.

365-366. *ADVANCED ORGANIC CHEMISTRY*. Throughout the year. Credit two hours a term. Prerequisite, Chemistry 307-308, 311-312 and 320, or consent of the instructor. Primarily for seniors and graduate students intending to do advanced work in organic chemistry or related fields. Enrollment limited for undergraduates to those having a record of 80 or better in prerequisite courses. Students may register for either term separately. Lectures, T Th 9. Messrs. BLOMQUIST, DETAR, and JOHNSON.

Fall term: survey of the more important classes of organic compounds and their reactions. Spring term: discussion of general topics (tautomerism, molecular rearrangements, stereochemistry).

[375-376. *SELECTED TOPICS IN ORGANIC CHEMISTRY*. Throughout the year. Credit two hours a term. Prerequisite, Chemistry 365-366. Primarily for graduate students. Open to undergraduates only with the consent of the instructor. Lectures, M W 12. Mr. BLOMQUIST.

Fall term: organic compounds of nitrogen and sulfur. Spring term: the simpler heterocycles and alicyclic compounds. Given in alternate years. Not offered in 1948-1949.]

380. *CHEMISTRY OF HIGH POLYMERS*. Fall term. Credit two hours. Prerequisite, Chemistry 320, or 365-366, and 403-404, or 407-408 and consent of the instructor. Primarily for graduate students. Lectures, M W 10. Mr. MILLER.

The mechanism of polymerization processes and the chemical structure and properties of high polymers will be discussed, with examples chosen from the more significant natural and synthetic high molecular weight materials. Given in alternate years.

[385. *PHYSICAL ASPECTS OF ORGANIC CHEMISTRY*. Spring term. Credit two hours. Prerequisite, Chemistry 320 or 365-366, 403-404, or 407-408, and consent of

the instructor. Primarily for graduate students. Lectures M W 10. Mr. MILLER.

A discussion of recent theoretical developments in organic chemistry and their application to typical reactions. Given in alternate years. Not offered in 1948-1949.]

395-396. *CHEMISTRY OF NATURAL PRODUCTS*. Throughout the year. Credit two hours a term. Prerequisite, Chemistry 320 or 365-366. Primarily for graduate students. Open to undergraduates by consent of the instructor. Students may register for either term separately. Lectures, T Th 11. Mr. CAIN.

A discussion of the organic chemistry of natural products. Fall term; terpenes, vitamin A, quinones, plant pigments, antibiotics, and alkaloids. Spring term: amino acids, proteins, carbohydrates, vitamin C, the vitamin B group, and steroids. Given in alternate years.

PHYSICAL CHEMISTRY

402. *INTRODUCTION TO PHYSICAL CHEMISTRY*. Spring term. Credit two hours. Prerequisite, Chemistry 301, Mathematics 156 or 163, and Physics 117. For students in Engineering. Lectures, Th S 11. Mr. LONG.

A brief survey of Physical Chemistry with emphasis on topics of interest to students in Engineering.

403-404. *INTRODUCTORY PHYSICAL CHEMISTRY*. Throughout the year. Credit three hours a term. Prerequisite, Chemistry 307-308, Mathematics 161-162-163, and Physics 107 and 108 (or their substantial equivalent). Required of candidates for the degree of B. Chem. Eng. Lectures, M W F 9. Mr. BRIGGS.

A systematic presentation of the principles of physical chemistry. The topics include: the properties of gases, liquids, and solids; physical and chemical equilibrium in homogeneous and heterogeneous systems; the mass law, theorem of Le Chatelier, and the phase rule; thermochemistry and elementary thermodynamics; the theory of solutions; ionic equilibria; chemical kinetics; problems in physical chemistry.

405-406. *ELEMENTARY PHYSICAL CHEMISTRY*. Throughout the year. Credit: Chemistry 405 three hours; Chemistry 406 two hours. Prerequisite, Chemistry 375 and Mathematics 153-154. Open only to students in the biological sciences. Lectures, Fall term, T Th S 12; Spring term, T Th 12. Mr. BRIGGS.

A survey of the principles of elementary physical chemistry, including an introduction to colloid chemistry and electrochemistry.

407-408. *INTRODUCTORY PHYSICAL CHEMISTRY*. Throughout the year. Credit three hours a term. Prerequisite, Chemistry 307-308, which may be taken simultaneously; Mathematics 171-172-173, or their equivalent; Physics 103 and 104, or 107 and 108. Required of candidates for the degree of A.B. with a major in chemistry, and open to other qualified students by consent of the instructor. Lectures, M W F 10. Mr. HOARD.

A study of the more fundamental principles of physical chemistry from the standpoint of the laws of thermodynamics, and of the kinetic theory. A unified treatment of the properties of matter, thermochemistry, the properties of solutions, and of equilibrium in homogeneous and heterogeneous systems. Chemical kinetics and catalysis are included.

411-412. *INTRODUCTORY PHYSICAL LABORATORY*. Throughout the year. Credit three hours a term. Prerequisite or parallel course, Chemistry 403-404, or 407-408. Enrollment may be limited. Laboratory, M T or Th F 2-4:30, or S 8-1. Mr. BRIGGS, Mr. HOARD, Mr. MUSCHLITZ, and assistants.

Qualitative and quantitative experiments illustrating the principles of physical chemistry, and practice in performing typical physico-chemical measurements.

[431-432. *APPLIED ELECTROCHEMISTRY*. Throughout the year. Credit two hours a term. Prerequisite, Chemistry 403-404, or 407-408. Lectures, T Th 11. Mr. BRIGGS.

Elementary theory of electrolysis and electromotive force. Electrolytic refining and extraction of metals; electroplating; electrolytic preparation of organic and inorganic compounds; electrothermal electrolysis; storage cells.

By electing Chemistry 465 (two or more hours), the student may obtain laboratory practice in many of the subjects which are presented in the lectures. Given in alternate years. Not offered in 1948-1949.]

[435. *INTRODUCTORY ELECTROCHEMISTRY*. Spring term. Credit three hours. Prerequisite, Chemistry 403-404, or 407-408. Lectures, M W 12. Laboratory, one period a week to be arranged. Mr. BRIGGS and assistant.

The theory of electrolysis and the voltaic cell. Laboratory practice in electrolysis, measurement of electromotive forces, transference numbers, decomposition voltages, and similar subjects. Not offered in 1948-1949.]

440. *COLLOID CHEMISTRY*. Spring term. Credit three hours. Prerequisite, Chemistry 403-404, or 407-408. Lectures, M W F 12. Mr. BRIGGS.

The general theory of colloid chemistry and adsorption, with emphasis on the preparation and properties of inorganic colloids.

445. *APPLICATION OF THE PHASE RULE*. Fall term. Credit three hours. Prerequisite, Chemistry 403-404, or 407-408. Lectures, M W F 12. Mr. BRIGGS.

The study and interpretation of typical phase diagrams, especially in the systems of two and three components, followed by a brief treatment of systems containing four or more components. Special attention will be given to metal alloy diagrams, to equilibria in saturated salt solutions, and to the problem of indirect analysis.

[451. *SOLID STATE*. Spring term. Credit three hours. Prerequisite, Chemistry 403-404, or 407-408. Lectures, hours to be arranged. Mr. HOARD.

Discussion of structural types established for crystals through x-ray analysis, ionic and atomic radii, coordination number, packing relations, and stereochemistry of molecules and complex ions. Correlation of structure with physical properties, especially for ionic and metallic crystals. Not offered in 1948-1949.]

455. *KINETICS OF CHEMICAL REACTIONS*. Fall term. Credit three hours. Prerequisite, Chemistry 403-404, or 407-408. Primarily for graduate students. Open to undergraduates by consent of the instructor. Lectures, M W F 10. Mr. LONG.

A general discussion of rates of reaction including: types of reactions, methods of measurement, theories of reaction rates, application to problems.

[460. *CHEMICAL PHYSICS*. Fall term. Credit three hours. Primarily for seniors and graduate students majoring in Chemistry and Physics. Lectures, M W F 10. Mr. DEBYE.

An elementary presentation of the principles involved in describing the structure and behavior of matter; atomic structure and the periodic table; inter-atomic forces; structure of solids; electrons in metals; temperature equilibrium, and statistics. Not offered in 1948-1949.]

465. *ADVANCED LABORATORY PRACTICE IN PHYSICAL CHEMISTRY*. Either

term. Credit two to six hours. Prerequisite, consent of the instructor. Hour and place to be arranged. Messrs. BAUER, BRIGGS, HOARD, LONG, and MUSCHLITZ.

471-472. *THERMODYNAMICS*. Throughout the year. Credit three hours a term. Prerequisite, Chemistry 403-404, or 407-408. Primarily for graduate students. Lectures, M W F 9. Mr. HOARD.

Development of the general equations of thermodynamics from the first and second laws. Exposition of the concepts of entropy and free energy. Applications to the study of physico-chemical equilibria in gases, liquids, solids, and liquid solutions. Problems.

[475. *THEORY OF SOLUTIONS*. Fall term. Credit three hours. Prerequisite, Chemistry 471-472. Primarily for graduate students. Mr. HOARD.

Not offered in 1948-1949.]

[480. *STATISTICAL MECHANICS*. Fall term. Credit three hours. Prerequisite, Chemistry 471. Primarily for graduate students. Lectures, M W F 12. Mr. BAUER. Not offered in 1948-1949.]

490. *INTRODUCTORY QUANTUM MECHANICS WITH CHEMICAL APPLICATIONS*. Spring term. Credit three hours. Prerequisite, consent of the instructor. Primarily for graduate students. Lectures, M W F 12. Mr. BAUER.

Elementary presentation of the principles of quantum mechanics. The basic ideas underlying the quantum theory of the chemical bond.

495. *MOLECULAR SPECTRA*. Either term. Credit three hours. Prerequisite, consent of the instructor. Primarily for graduate students majoring in Physical Chemistry and Physics. Hours to be arranged. Given upon registration of five or more students. Mr. BAUER.

Brief review of atomic spectra. Description of the various types of molecular spectra; the rotation and vibration of diatomic molecules, electronic states and electronic transitions. A résumé of continuous and diffuse molecular spectra with reference to the subject matter considered in photochemistry. Normal coordinate treatment of the vibrations of polyatomic molecules and the analysis of their Raman and infrared absorption spectra. Discussion of the relation between molecular structure and molecular constants.

THE CLASSICS

Mr. JAMES HUTTON, *Chairman*; Messrs. EDWARD L. BASSETT, HARRY CAPLAN, GORDON M. KIRKWOOD, FRIEDRICH SOLMSEN, FREDERICK O. WAAGE.

Those whose major study is in the Classics must complete twenty hours of advanced courses in the Department (Greek courses above 201 or Latin courses above 206), and fifteen hours, selected after conference with the adviser, in related subjects. Related subjects for this purpose are Ancient History, modern foreign languages and literatures, particularly French and German, Ancient Philosophy, and courses 201-202, 214, and 401 in the Division of Literature.

Those whose major study is in Literature, with a center in the Classics, should consult the announcement of the Division of Literature.

ARCHAEOLOGY AND ANCIENT ART

HISTORY OF PAINTING AND SCULPTURE. (See Fine Arts 101.) Only the work of the first term will receive credit in Classics.

HISTORY OF GREEK SCULPTURE. (See Fine Arts 301.)

ART OF THE ROMAN EMPIRE. (See Fine Arts 302.)

[*NUMISMATICS: ANCIENT COINAGE.* (See Fine Arts 315.) Not offered in 1948-1949.]

GREEK

101. *GREEK FOR BEGINNERS.* Either term. Credit three hours. M W F 12. Mr. KIRKWOOD.

Introduction to Homer's *Iliad*.

103. *HOMER'S ILIAD.* Either term. Credit three hours. Prerequisite, Greek 101. M W F 12. Fall term, Mr. HUTTON; Spring term, Mr. SOLMSEN.

Continuation of Greek 101.

201. *ATTIC GREEK.* Either term. Credit three hours. Prerequisite, Greek 103. M W F 9. Fall term, Mr. BASSETT; Spring term, Mr. SOLMSEN.

Xenophon, *Anabasis*; Plato, *Selected Dialogues*.

203. *EURIPIDES, IPHIGENIA IN TAURIS, AND ALCESTIS; NEW TESTAMENT, SELECTIONS.* Either term. Credit three hours. Prerequisite, Greek 201. M W F 9. Fall term, Mr. ———; Spring term, Mr. KIRKWOOD.

209-210. *GREEK COMPOSITION.* Throughout the year. Credit one hour a term. Prerequisite, Greek 103, or the equivalent. T 2. Mr. BASSETT.

301-302. *ARISTOPHANES, CLOUDS; SOPHOCLES, OEDIPUS REX; HERODOTUS.* Throughout the year. Credit three hours a term. Prerequisite, Greek 203. T Th S 10. Fall term, Mr. CAPLAN; Spring term, Mr. ———.

305-306. *LYRIC POETRY; AESCHYLUS, PROMETHEUS BOUND; THEOCRITUS; DEMOSTHENES, PHILIPPIC ORATIONS.* Throughout the year. Credit three hours a term. Prerequisite, Greek 301-302. T Th S 10. Mr. ———.

309-310. *ADVANCED GREEK COMPOSITION.* Throughout the year. Credit one hour a term. Prerequisite, Greek 209-210, or the equivalent. Th 2. Fall term, Mr. KIRKWOOD; Spring term, Mr. SOLMSEN.

390. *GREEK DIALECTS.* Fall term. Credit two hours. For graduate students. T Th 12. Mr. BASSETT.

395. *SEMINAR.* Throughout the year. Credit three hours a term. For graduate students. Library, Classical Seminar Room. W 2-4. Mr. HUTTON. Subject to be announced.

LATIN

105-106. *LATIN FOR BEGINNERS.* Throughout the year. Credit three hours a term. M W F 12. Mr. BASSETT.

107. *FRESHMAN COURSE: SELECTIONS FROM CICERO AND VIRGIL.* Fall term. Credit three hours. Prerequisite, Latin 106 or two units of entrance Latin. T Th S 10. Mr. ———.

For the second term of this course see Latin 110.

109. *FRESHMAN COURSE: VIRGIL AND OVID*. Fall term. Credit three hours. For students offering three units of entrance Latin. M W F 11; T Th S 10. Mr. SOLMSEN and Mr. BASSETT.

For the second term of this course see Latin 110.

110. *FRESHMAN COURSE: HORACE, ODES AND EPODES*. Spring term. Credit three hours. Prerequisite, Latin 107 or 109. M W F 11; T Th S 10. Mr. SOLMSEN and Mr. BASSETT.

111-112. *FRESHMAN COURSE*. Throughout the year. Credit three hours a term. For students offering four units of entrance Latin. M W F 11. Fall term, Mr. CAPLAN; Spring term, Mr. HUTTON.

Cicero, *De Senectute*; Horace, *Odes* and *Epodes*.

115-116. *LATIN LANGUAGE REVIEW*. Throughout the year. Credit one hour a term. For freshmen. Th 12. Mr.———.

205-206. *TERENCE, ANDRIA; CATULLUS; HORACE, SATIRES AND EPISTLES; VIRGIL, GEORGICS; LIVY*. Throughout the year. Credit three hours a term. Prerequisite, Latin 109-110, or 111-112. M W F 11. Fall term, Mr. HUTTON; Spring term, Mr. KIRKWOOD.

215. *REMAINS OF EARLY LATIN*. Fall term. Credit two hours. Prerequisite or parallel course, Latin 205-206, or 317-318. T Th 11. Mr. KIRKWOOD.

216. *VIRGIL, AENEID, BOOKS VII-XII*. Spring term. Credit two hours. Prerequisite or parallel course, Latin 205-206, or 317-318. T Th 11. Mr.———.

221-222. *LATIN COMPOSITION*. Throughout the year. Credit one hour a term. Prerequisite, Latin 109-110, or 111-112. W 2. Fall term, Mr. KIRKWOOD; Spring term, Mr. HUTTON.

315-316. *THE GREATER REPUBLICAN WRITERS: PLAUTUS, CICERO, LUCRETIUS*. Throughout the year. Credit three hours a term. Prerequisite, Latin 205-206. T Th S 9. Mr. SOLMSEN.

[317-318. *LITERATURE OF THE EARLY EMPIRE: TACITUS, ANNALS; JUVENAL; PLINY'S LETTERS; SENECA'S LETTERS*. Throughout the year. Credit three hours a term. Prerequisite, Latin 205-206. Not offered in 1948-1949.]

321-322. *LATIN COMPOSITION: ADVANCED COURSE*. Throughout the year. Credit one hour a term. For undergraduates who have completed Latin 221-222, and for graduate students. M 2. Fall term, Mr. SOLMSEN; Spring term, Mr.———.

[347. *HISTORY OF THE LATIN LANGUAGE*. Credit two hours. For upperclassmen and graduate students. Not offered in 1948-1949.]

348. *VULGAR LATIN: PETRONIUS, CENA TRIMALCHIONIS; VULGAR LATIN INSCRIPTIONS*. Spring term. Credit two hours. T Th 12. Mr. BASSETT.

[350. *COMPARATIVE GRAMMAR OF GREEK AND LATIN*. Credit two hours. For upperclassmen and graduate students. Not offered in 1948-1949.]

[369. *MEDIEVAL LATIN LITERATURE*. Credit three hours. Prerequisite, three years of High School Latin or the equivalent. Not offered in 1948-1949.]

[381-382. *SEMINAR: HORACE*. Throughout the year. Credit three hours a term. For graduate students. Not offered in 1948-1949.]

CLASSICS IN TRANSLATION

401. *FOUNDATIONS OF WESTERN THOUGHT*. Fall term. Credit three hours. Open to sophomores and upperclassmen. M W F 10. Mr. SOLMSEN.

A study of the beliefs and ideas—religious, moral, social, and scientific—which were current or advanced in the Greek, Roman, and Early Christian period of Western Civilization; the history and transformation of these ideas and their integration into coherent bodies of thought. Popular thought and practices as well as the ideas of leading thinkers and poets will be considered. Reading of representative material in translation. Two hours will be given to lectures, one hour to discussion of the ideas treated. Attention will be given to their influence on later thought and their relevance to present-day problems.

ENGLISH TRANSLATIONS OF GREEK AND LATIN CLASSICS. (See Literature 201-202.)

HUMANISM AND THE RENAISSANCE. (See Literature 214.)

PRINCIPLES OF LITERARY CRITICISM. (See Literature 401-402.)

ECONOMICS

Mr. F. A. SOUTHARD, JR., *Chairman*; Messrs. G. P. ADAMS, JR., DONALD ENGLISH, J. G. B. HUTCHINS, A. E. KAHN, M. S. KENDRICK, R. E. MONTGOMERY, J. E. MORTON, P. M. O'LEARY, H. L. REED, E. P. REUBENS, D. G. TYNDALL.

For a major in Economics the following courses must be completed: (1) Economics, 101, or 105 and 106, or the equivalent; and twenty-four hours of advanced courses, including Economics 901; (2) in related subjects, fifteen hours in not more than three of the following Departments: Far Eastern Studies 201-202, Geology 105 and 107-108, Government, History, Mathematics, Philosophy, Psychology, and Sociology.

No course may be offered as a related subject which is counted in satisfaction of the distribution requirements (i. e., prescribed subjects).

Students who intend to register in Arts and Sciences and in the School of Business and Public Administration or in the Law School will be required to complete fifteen hours of advanced courses in Economics, including Economics 901, and six hours of related courses.

Students whose work in the College and particularly in the courses comprising their major has been of high quality may be permitted to enroll in Informal Study in Economics (090) in their senior year.

Candidates for Honors in Economics will be required to pass a special examination and should consult their advisers before the beginning of their senior year.

101. *MODERN ECONOMIC SOCIETY*. Either term. Credit five hours. Not open to first-term freshmen. Freshmen in their second term will be admitted by permission. M T W Th F 8, 10, 11, 12, or 1.

A survey of the existing economic order, its more salient and basic characteristics, and its operations.

105. *MODERN ECONOMIC SOCIETY*. Fall term. Credit three hours. Open to a limited number of freshmen. M W F 8, 12, 1, 2, or 3; T Th S 8.

This course and course 106 cover the same subject matter as Economics 101.

106. *MODERN ECONOMIC SOCIETY*. Spring term. Credit three hours. Continuation of Economics 105. M W F 8, 12, 1, 2, or 3; T Th S 8.

107. *INTRODUCTION TO ECONOMICS*. Either term. For students in Engineering. Credit three hours. Hours to be arranged.

An introduction to the more essential economic features of contemporary American Society.

MONEY, BANKING, AND TRADE FLUCTUATIONS

201. *MONEY AND BANKING*. Either term. Credit three hours. Prerequisite, Economics 101 or 106. Not to be counted for major credit and not offered for majors in economics. M W F 12. Mr. KAHN.

A general survey of the nature and functions of money and credit, and of the operation of the banking system.

203. *MONEY, CURRENCY, AND BANKING*. Fall term. Credit three hours. Limited to economics majors. Prerequisite, Economics 101, or 106. M W F 9. Mr. REED.

A study of our currency system and banking processes for the primary purpose of training the student to determine the influence of monetary factors in economic problems.

204. *MONEY, CURRENCY, AND BANKING*. Spring term. Credit three hours. Limited to economics majors. M W F 9. Mr. REED.

A continuation of Economics 203.

210. *COMMERCIAL BANKING*. Spring term. Credit three hours. Prerequisite, Economics 204, or consent of the instructor. T Th S 11. Mr. REED.

A course dealing with the problems of bank administration.

220. *TRADE FLUCTUATIONS*. Fall term. Credit three hours. Prerequisite, Economics 204, or consent of the instructor. T Th S 11. Mr. REED.

A study of the causes and effects of trade recessions and revivals, with an introduction to the methods of general forecasting.

ACCOUNTING AND STATISTICS

301. *ACCOUNTING*. Either term. Credit three hours. Prerequisite, Economics 101, or 106. Fall term, T Th S 9; Spring term, T Th S 10. One practice period, T 2-4, or W 2-4. Mr. ENGLISH.

Theory of debit and credit; the journal and ledger; the development of books of original entry; preparation of income statements and balance sheets.

302. *ACCOUNTING*. Either term. Credit three hours. Prerequisite, Economics 301. Fall term, T Th S 10, Spring term, T Th S 9. One practice period, Th or F 2-4. Mr. ENGLISH.

Capital stock accounts; bonds and their valuation; amortization, reserves and reserve funds, analysis of income statements and balance sheets.

305. *ADVANCED ACCOUNTING*. Fall term. Credit three hours. Prerequisite, Economics 302. Limited to seniors who have the consent of the instructor. T Th S 10. Mr. SHANNON.

Problems of income determination and allocation; the admission, valuation, and presentation of each typical asset and equity element in a balance sheet and the related revenue and expense aspects; analysis and interpretation of financial state-

ments according to varying philosophies; special topics—sinking funds, special reserves, and operating schedules.

306. *ADVANCED ACCOUNTING*. Spring term. Credit three hours. Limited to seniors who have the consent of the instructor. T Th S 10. Mr. SHANNON.

A continuation of Economics 305. Analysis of installment sales and long-term contracts; consignments; branch accounting; consolidated statements; foreign exchange; reorganization and liquidation problems; estate and trust accounting; insurance, source and application of funds statement and related analysis of financial statements.

STATISTICS. (I.L.R. 40) Fall term. Credit three hours. Prerequisite, Mathematics 111, or the successful passing of the Cornell Mathematics test. M W 11 and one two-hour laboratory to be arranged. Mr. MORTON.

An introduction to basic concepts and uses of descriptive statistics and problems of drawing valid inferences from statistical data. This course may be taken as a prerequisite for certain of the specialized courses on applications of statistics offered in various departments. It is not intended for students who have had, or are planning to take, college mathematics through calculus; such students should take Statistics 103-104 (Interdepartmental Course). Specific topics included are: classification, averages, dispersion, correlation, probability, tests of significance, confidence intervals.

ECONOMIC STATISTICS (I.L.R. 41) Spring term. Credit three hours. Prerequisite, Statistics 40* or equivalent. T Th 11 and a two-hour laboratory to be arranged. Mr. MORTON.

Application of statistical techniques to economical data with particular emphasis on the analysis of index numbers, time series, income distributions, and of empirical demand and cost functions.

ORGANIZATION AND CONTROL OF INDUSTRY

311. *CORPORATION FINANCE*. Either term. Credit three hours. Prerequisite, Economics 301, or its equivalent. Fall term, T Th S 9; Spring term, T Th S 9. Mr. TYNDALL.

A study of the financial practices of business corporations in the United States; types of corporate securities; sources of capital funds; determination and administration of corporate incomes; financial difficulties and corporate reorganizations; the relation of corporate practices to the functioning of the American economic system; and the regulatory activities of the Securities and Exchange Commission.

321. *PUBLIC CONTROL OF BUSINESS*. Fall term. Credit three hours. Prerequisite, Economics 101, or 106. M W F 9. Mr. KAHN.

A study of the character of modern industrial organization, price and production policies of large-scale industry and trade association practices, leading to an examination of the economic and legal aspects of public control with reference both to the anti-trust law policy and special areas of regulation other than public utilities.

322. *PUBLIC CONTROL OF BUSINESS*. Spring term. Credit three hours. Prerequisite, Economics 321, or consent of the instructor. M W F 9. Mr. KAHN.

A continuation of Economics 321 with special reference to the regulation of public utility industries and recent developments in the field of public control.

331. *TRANSPORTATION*. Fall term. Credit three hours. Limited to seniors who

have taken Economics 101, or the equivalent. M W F 10. Mr. HUTCHINS.

A study of American transportation from the points of view of operators, shippers, and public authorities. Attention is given to the national traffic pattern; railway operations, rates, finance, and control; motor carriers. Lectures and cases.

332. *TRANSPORTATION*. Spring term. Credit three hours. Limited to seniors who have taken Economics 331. M W F 10. Mr. HUTCHINS.

A continuation of course 331. The subjects covered include: inland water transport, ocean shipping, air transport, and national transportation policy.

LABOR ECONOMICS

401. *LABOR CONDITIONS AND PROBLEMS*. Fall term. Credit three hours. Prerequisite, Economics 101, or the equivalent. M W F 10. Mr. MONTGOMERY.

An introduction to the field of Labor Economics and a survey of the more basic labor problems growing out of modern economic arrangements.

402. *TRADE UNIONISM AND COLLECTIVE BARGAINING*. Spring term. Credit three hours. Prerequisite, Economics 401, or consent of the instructor. M W F 10. Mr. MONTGOMERY.

A study of the origins, philosophic basis, aims, and policies of trade unions, of the economic implications of trade unionism in modern economic life, and of collective bargaining in selected industries.

410. *LEGAL AND CONSTITUTIONAL ASPECTS OF LABOR PROBLEMS*. Fall term. Credit two hours. Consult the instructor before registering. Th 2-4. Mr. MONTGOMERY.

A study of the legal aspects of trade union objectives and methods and an examination of State-labor relationships. Among the topics treated: legal theories underlying labor law; statutory enactments affecting trade unions; injunctions, damage suits, criminal prosecutions, restrictions upon employers; conciliation, arbitration, mediation; and various types of labor legislation.

420. *WAGE DETERMINATION AND RELATED PROBLEMS*. Spring term. Credit two hours. Prerequisite, Economics 402, or consent of the instructor. Th 2-4 and an additional hour to be arranged. Mr. MONTGOMERY.

A study of wage-hour and labor-market structure; of the determinants of distribution; of the factors commonly involved in collective wage determination; of wage policies and their relation to industrial fluctuations; and of other wage, hour, and employment problems.

PUBLIC FINANCE

TAXATION. (Agricultural Economics 138). Fall term. Credit three hours. Open to upperclassmen who have taken Economics 101, or the equivalent. M W F 11. Mr. KENDRICK.

A study of the principles and practices of public finance, with emphasis on taxation. Among the topics examined are: growth of public expenditures; the changing pattern of federal, state, and local taxation; the incidence of taxation; and the problem of war finance.

502. *FEDERAL PUBLIC FINANCE*. Spring term. Credit three hours. Prerequisite, Taxation (Agricultural Economics 138) or any other introductory course in public finance. M W F 11. Mr. KENDRICK.

An examination of national problems of taxation, expenditures, public debt, and fiscal policy.

[503. *STATE AND LOCAL FINANCE*. Spring term. Credit three hours. Not offered in 1948-1949.]

ECONOMIC HISTORY

601. *ECONOMIC AND BUSINESS HISTORY, 1750-1860*. Fall term. Credit three hours. Limited to seniors who have taken Economics 101. T Th S 10. Mr. HUTCHINS.

A study of the evolution of economic structure, business organization and practices, and public economic policies in America and Europe. Analysis of primary economic changes. Case studies of the development of selected enterprises, involving critical analysis of business policy and strategy in relation to contemporary economic conditions.

602. *ECONOMIC AND BUSINESS HISTORY SINCE 1860*. Spring term. Credit three hours. Limited to seniors who have taken Economics 101. T Th S 10. Mr. HUTCHINS.

A continuation of Economics 601, but that course is not a prerequisite.

INTERNATIONAL ECONOMICS

701. *INTERNATIONAL TRADE AND COMMERCIAL POLICY*. Fall term. Credit three hours. Prerequisite, Economics 101, or the equivalent. T Th S 11. Mr. SOUTHARD.

A survey of foreign trade, with special reference to the United States. The theory of international trade; cartels and other international commercial agreements; commercial policy.

702. *INTERNATIONAL FINANCE*. Spring term. Credit three hours. Prerequisite, Economics 201, or 204, or 701. T Th S 11. Mr. SOUTHARD.

The balance of international payments; foreign exchange procedure and policy; exchange stabilization and control; current international financial problems.

801. *ECONOMICS OF THE FAR EAST*. Fall term. Credit three hours. Prerequisite, Economics 101 or the equivalent, or consent of the instructor. T Th S 10. Mr. REUBENS.

An analytic study of the economic structure and development of the major Far Eastern countries, emphasizing the process and problems of industrialization, and including postwar problems of reconstruction, the role of the United States and other foreign powers, and the applicability of Western economic theory to Oriental conditions.

802. *ECONOMICS OF THE FAR EAST*. Spring term. Credit three hours. Prerequisite, Economics 801 or consent of the instructor. T Th S 10. Mr. REUBENS.

Continuation of Economics 801. Students who have not taken Economics 801 but have adequate preparation in Economics and/or the Far East area will be admitted.

ECONOMIC THEORY

901. *INTERMEDIATE ECONOMIC THEORY*. Either term. Credit three hours. Not open to Sophomores. Required in the junior or senior year of all students major-

ing in Economics. Prerequisite, Economics 101, or the equivalent. M W F 2. Mr. ADAMS and Mr. TYNDALL.

An analysis of the pricing processes in a free enterprise economy under varying competitive conditions, and their role in the allocation of productive resources and the functional distribution of the national income.

[902. *NATIONAL WEALTH AND INCOME*. Spring term. Credit three hours. Prerequisite, Economics 901, or consent of the instructor. M W F 2. Mr.———.

A statistical approach to structure of the American economy through studies of the size, composition and distribution of the national income, with applications to the problems of economic planning. Not given in 1948-1949.]

903. *HISTORY OF ECONOMIC THOUGHT*. Throughout the year. Credit three hours a term. M W F 8. Mr. ADAMS.

A survey of the development of economic ideas and their institutional background from the Mercantilists to Alfred Marshall. Primary emphasis will be given to the classical tradition.

910. *ECONOMICS OF DISSENT*. Fall term. Credit two hours. Open to upperclassmen with consent of the instructor. T 2-4. Mr. MONTGOMERY.

A study of the literature of social protest; of unorthodox or dissenting economic doctrines; and of the various types of economic organization that have been proposed or attempted, including the Utopias, Marxian Socialism, Collectivism, Anarchism, the Single Tax, Syndicalism, Guild Socialism, Fabian Socialism, and Communism.

ENGLISH

Mr. ———, Chairman; Messrs. M. H. ABRAMS, H. H. ADAMS, R. L. ARENDS, R. C. BALD, G. F. CRONKHITE, DAVID DAICHES, R. H. ELIAS, F. B. FREEMAN, W. H. FRENCH, W. B. GRAGG, J. W. HALL, MAURICE HATCH, BAXTER HATHAWAY, G. H. HEALEY, E. H. HOFER, C. W. JONES, R. M. LADUE, J. G. LINN, E. S. MERTON, F. E. MINEKA, H. A. MYERS, DAVID NOVARR, EDWIN NUNGEZER, J. D. OGDEN, H. F. POMMER, Mrs. EUNICE RAIMON, Mrs. ROSAMOND ROBINSON, Messrs. W. M. SALE, JR., J. A. SESSIONS, M. W. STEARNS, JOHN STUMPF, H. W. THOMPSON, C. I. WEIR, JR., PAUL WELSH.

For major work in English the student is required to complete (1) English 111-112, or the equivalent; (2) English 251-252, normally to be taken in the sophomore year; (3) twenty-four hours of other courses in the Department of English or the Division of Literature; and (4) eighteen hours in related subjects.

Courses numbered below 300 are introductory and are intended for underclassmen. All other courses are strictly limited to upperclassmen, except that those who have been excused from any part of English 111-112 may in their fourth term enter one course numbered above 300.

Students excused from English 112 may, in the second term of their freshman year, register in English 201, 203, or 251, or Literature 101, but not in other courses in either department. Such exemptions, however, cannot be made until the student has completed English 111. In later terms, such students may register in any course to which English 111 and 112 are prerequisite.

The twenty-four hours of other courses in the Department of English or the Division of Literature must, with the exceptions listed below, be distributed as follows: twelve hours in "period" courses, six hours in "author" courses, and six hours in "type" courses. The following are classified as "period" courses: English 305-306, 309-310, 313-314, 317-318, 321-322, 329-330, 376, 403-404, 409-410, Literature 201-202, 211-212. The following are classified as "author" courses: English 365-366, 369-370, 373, 374, 377, 379. The following are classified as "type" courses: English 325, 326, 335, 337, 341-342, 345, 349, 355, 357, 405-406, 407-408, Literature 301-302, 311-312, 401-402, 411, Speech and Drama 455.

Students specially interested in writing may, instead of following the distribution outlined above, distribute their twenty-four hours of courses in English as follows: twelve hours of English 385-386, 388, 389, 485-486, Speech and Drama 461-462; six hours of "period" courses; six hours of either "author" or "type" courses.

Prospective teachers of English in secondary schools must elect a special sequence of required and related courses to satisfy the major requirements. They should consult Mr. THOMPSON, preferably during their second term, before making out their program for the sophomore year.

Candidates for the degree of Bachelor of Arts with Honors in English are required to take thirty hours of courses in the Department of English and the Division of Literature, in addition to English 251-252. Seminars in literary and critical problems, open only to honors candidates, will be available in the junior and senior years; from these, candidates are to elect twelve of their thirty hours. They should consult Mr. ABRAMS before pre-registering for the junior year.

The eighteen hours in related subjects must be chosen from courses listed in the announcements under Classics, Fine Arts, History, Music, Philosophy, Speech and Drama, and Modern Languages and their Literatures. No course in a modern language taken to satisfy the College proficiency requirement may be counted as a related subject. The student must complete twelve of his hours in related subjects in one department.

111-112. **INTRODUCTORY COURSE IN READING AND WRITING.** Throughout the year. Credit three hours a term. Open to freshmen. English 111 is prerequisite to 112. M W F 8, 9, 10, 11, 12, 2, or 3; T Th S 8, 9, 10, 11, or 12. Mr. SALE and others.

The aim of this course is to increase the student's ability to communicate his own thought and to understand the thought of others.

ENGLISH FOR FOREIGNERS. (See English 101, 102, 103, 201, Division of Modern Languages.)

COURSES FOR SOPHOMORES

201. **PROSE AND COMPOSITION.** Either term. Credit three hours. Prerequisite, English 111 and 112 or the equivalent. Fall term: M W F 8, 9, 10, 12, or 3; T Th S 10. Mr. FRENCH and others.

The study and practice of competent writing, chiefly of exposition; the outline; the sentence; reading and analyzing expository prose; frequent practice in writing; personal conferences. Not open to those who have credit for English 203.

202. **PROSE AND COMPOSITION.** Either term. Credit three hours. Prerequisite, English 201 or 203. Fall term: M W F 12; T Th S 10. Mr. FRENCH and others.

A continuation of English 201; writing essays and stories; study of recent prose; personal conferences. Not open to those with credit for English 204.

203. *SPECIAL FORMS OF WRITING*. Spring term. Credit three hours. This is a special section of the first term of English 203-204 (see below) scheduled in the Spring term for the convenience of freshmen excused from English 112 and to be elected only by them. T Th 12, and conferences to be arranged. Mr.———.

203-204. *SPECIAL FORMS OF WRITING*. Throughout the year. Credit three hours a term. First term prerequisite to second. Not open to those taking or having taken English 201-202, but students with credit for 201 may enter 204. M W 12, and conferences to be arranged. Mr. SESSIONS.

Practice in writing verse, narrative, and the personal essay.

221. *INTRODUCTION TO POETRY*. Spring term. Credit three hours. M W F 10. Mr. STEARNS.

Selected English and American poems.

251. *GREAT ENGLISH WRITERS*. Either term. Credit three hours. Fall term: M W F 9, 11, 12, 2, or 3; T Th S 10. Spring term: M W F 9, T Th S 11. Mr. MINEKA and others.

Studies in selected works of great English writers, Chaucer to the eighteenth century.

Note: The *Spring* term of 251 is intended primarily for students exempted from English 112. All others must secure the consent of Mr. Mineka if they wish to deviate from the normal procedure of taking 251 in the Fall and 252 in the Spring.

252. *GREAT ENGLISH WRITERS*. Spring term. Credit three hours. Prerequisite, English 251. M W F 9, 11, 12, 2, or 3; T Th S 11. Mr. MINEKA and others.

Studies in selected works of great English writers, from the eighteenth century to the present day.

261. *INTRODUCTION TO PROSE FICTION*. Fall term. Credit three hours. M W F 10. Mr. WEIR.

Representative types of the novel.

COURSES FOR UPPERCLASSMEN

ENGLISH TRANSLATIONS OF GREEK AND LATIN CLASSICS. (See Literature 201-202.)

305-306. *OLD ENGLISH PROSE AND POETRY*. Throughout the year. Credit three hours a term. T Th S 11. Mr. FRENCH.

Philology and literature from the Anglo-Saxon invasion to the Norman conquest. Most of *Beowulf* will be read in the second term. This course is recommended by the Department to all who intend to become graduate students in English.

SURVEY OF MEDIEVAL LITERATURE. (See Literature 211-212.)

309-310. *ENGLISH NON-DRAMATIC LITERATURE 1550-1660* (excluding Milton). Throughout the year. Credit three hours a term. T Th S 11. Fall term, Mr. BALD; spring term, Mr. MERTON.

Fall term: studies in prose and poetry from More to Bacon. Spring term: prose and poetry from Donne to Marvell.

313-314. *ENGLISH LITERATURE 1600-1790*. Throughout the year. Credit three hours a term. T Th S 10. Mr. ABRAMS.

Major prose and poetry from Dryden to Blake; its relations to social and philosophic movements and to contemporary developments in the other arts.

317-318. *THE ROMANTIC PERIOD*. Throughout the year. Credit three hours a term. T Th S 11. Mr. MINEKA.

General literary tendencies and thought of the period. Poetry and prose of Wordsworth, Coleridge, Byron, Shelley, Keats, and others.

321-322. *THE VICTORIAN PERIOD*. Throughout the year. Credit three hours a term. M W F 11. Mr. JONES.

Poetry, prose, and drama of the major authors from Carlyle to Shaw, emphasizing the interest of men of letters in reconstruction and reform following the industrial and democratic revolutions.

326. *MODERN ENGLISH POETRY*. Spring term. Credit three hours. T Th S 10. Mr. DAICHES. (Will not be given in 1949-1950.)

The poetry of Yeats and Eliot, with some of their critical and other prose work.

329-330. *AMERICAN LITERATURE*. Throughout the year. Credit three hours a term. M W F 9. Fall term, Mr. MYERS; spring term, Mr. THOMPSON.

Fall term: Revolution to the Civil War. Spring term: 1865 to the present.

335. *THE MODERN AMERICAN NOVEL*. Spring term. Credit three hours. M W F 10. Mr. SALE.

A critical study of American fiction, beginning with Howells and Mark Twain and concluding with selected contemporary novels.

[337. *THE MODERN ENGLISH NOVEL*. Given every second year. Not given in 1948-1949.]

DRAMA AND THE THEATRE. (See Literature 301-302.)

341-342. *ELIZABETHAN AND EARLY STUART DRAMA* (excluding Shakespeare). Throughout the year. Credit three hours a term. M W F 10. Mr. NUNGEZER.

[345. *THE DRAMA OF THE RESTORATION AND THE EIGHTEENTH CENTURY*. Given every second year. Not given in 1948-1949.]

AMERICAN DRAMA AND THEATRE. (See Speech and Drama 455.)

349. *RECENT AMERICAN POETRY*. Fall term. Credit three hours. M W F 12. Mr. FRENCH. (Will not be given in 1949-1950.)

355. *AMERICAN FOLK-LITERATURE*. Fall term. Credit three hours. T Th S 9. Mr. THOMPSON.

Backgrounds of American literature and life revealed in traditional tales, ballads, proverbs, games, customs, and place-names. Emphasis upon ballads, and upon methods of collecting and classifying folklore.

[357. *BALLAD AND FOLKTALE*. Given every second year. Not given in 1948-1949.]

365-366. *CHAUCEER AND HIS AGE*. Throughout the year. Credit three hours a term. M W F 12. Fall term, Mr. STEARNS; spring term, Mr. FRENCH.

Fall term: Chaucer's life, contemporaries, minor poems, *Troilus and Criseyde*, and Prologue to *The Canterbury Tales*. Spring term: *The Canterbury Tales* and Chaucer's successors in the fifteenth century. May be entered in the spring term.

369-370. *SHAKESPEARE*. Throughout the year. Credit three hours a term. M W F 11. Mr. BALD.

Fall term: comedies and histories. Spring term: tragedies.

373. *MILTON*. Fall term. Credit three hours. T Th S 10. Mr. DAICHES.

A study of Milton's poetry and of selections from his prose.

[374. *TENNYSON, ARNOLD, AND RUSKIN*. Given every second year. Not given in 1948-1949.]

376. *AMERICAN COLONIAL LITERATURE*. Spring term. Credit three hours. T Th S 10. Mr. FREEMAN. (Will not be given in 1950.)

The roots of American culture and literature, from 1614 to 1763, through a study of the poetry and prose of the Eastern, Middle, and Southern Colonies. Such figures as Captain John Smith, Anne Bradstreet, the Mathers, William Byrd, Jonathan Edwards, and Benjamin Franklin will be considered.

377. *EMERSON, THOREAU, AND WHITMAN*. Spring term. Credit three hours. Prerequisite, English 329-330, or consent of the instructor. M W F 2. Mr. MYERS.

An intensive study of three major American writers with special attention to transcendentalism and democratic ideals.

379. *POE, HAWTHORNE, AND MELVILLE*. Fall term. Credit three hours. Prerequisite, English 329-330, or consent of the instructor. M W F 2. Mr. THOMPSON.

A critical study of three major American writers with particular emphasis on their contributions to the development of American fiction.

385-386. *NARRATIVE WRITING*. Throughout the year. Credit three hours a term. Prerequisite, consent of the instructor; ordinarily English 202 or 204 will be prerequisite. First term prerequisite to the second. T Th 11 and conferences to be arranged. Mr. HATHAWAY.

The technique of fiction; study of models; criticism of students' stories.

388. *VERSE WRITING*. Spring term. Credit three hours. Prerequisite, two terms of courses 201-204, or consent of the instructor. T Th S 9. Mr. HATHAWAY. (Will not be given in 1949-1950.)

The technique of poetry; study of models; criticism of students' poems; personal conferences.

389. *ADVANCED EXPOSITION*. Fall term. Credit three hours. Prerequisite, consent of the instructor; ordinarily English 202 or 204 will be prerequisite. T Th S 9. Mr. HATHAWAY.

English syntax, rhetoric, and the writing of expository prose.

485-486. *SEMINAR IN WRITING*. Throughout the year. Credit three hours a term. Prerequisite, consent of the instructor; ordinarily six hours from courses 385-389 will be prerequisite. First term prerequisite to second. Mr. HATHAWAY.

SEMINARS FOR HONORS STUDENTS

403-404. *APPROACHES TO LITERATURE*. Throughout the year. Credit three hours a term. Seminar open only to candidates for honors in English in their junior year. One meeting a week at a time to be arranged. Mr. ABRAMS.

Ways of viewing literature: historical, biographical, sociological, aesthetic, and as documents in the history of ideas. In 1948-1949, examples for analysis will be chosen from the poetry of Coleridge, Wordsworth, and Keats.

405-406. *LITERARY THEORY AND LITERARY PRACTICE*. Throughout the year. Credit three hours a term. Seminar open only to candidates for honors in English in their junior year. One meeting a week at a time to be arranged. Mr. SALE.

The relations between prevailing theories and the writing of literature; in 1948-1949, to be devoted in the main to fiction beginning in the latter half of the nineteenth century.

[407-408. *PROBLEMS IN LITERARY HISTORY*. Throughout the year. Credit three hours a term. Seminar open only to candidates for honors in English in their senior year. Begins in Fall of 1949.]

[409-410. *PROBLEMS IN LITERATURE AND THE HISTORY OF IDEAS*. Throughout the year. Credit three hours a term. Seminar open only to candidates for honors in English in their senior year. Begins in Fall of 1949.]

PLAYWRITING. (See Speech and Drama 461-462.)

PRINCIPLES OF LITERARY CRITICISM. (See Literature 401-402.)

PSYCHOLOGY OF LITERATURE. (See Literature 411.)

FAR EASTERN STUDIES

Mr. KNIGHT BIGGERSTAFF, *Chairman*; Mr. HERBERT W. BRIGGS; Miss GUSSIE E. GASKILL; Messrs. CHARLES F. HOCKETT, N. ALLEN PATTILLO, E. P. REUBENS, HAROLD E. SHADICK, LAURISTON SHARP.

For a major in Far Eastern Studies the student must complete eighteen hours in the Chinese language; Far Eastern Studies 201-202 and 951-952; eighteen additional hours selected from the courses listed below; and such courses in other fields as may be prescribed by the major adviser.

201-202. *INTRODUCTION TO CONTEMPORARY CHINA AND THE FAR EAST*. Throughout the year. Credit three hours a term. Not open to freshmen. 202 may be taken prior to 201. M W F 10. Mr. BIGGERSTAFF, Mr. SHARP, and Mr. REUBENS, with some lectures by other members of the staff. *Note*: 202 will not be offered in the Spring term of 1949, but it will be offered in 1949-1950.

In course 201 the student will be introduced to the land, the people, and the social, political, and economic life and organization of modern China. Attention will also be given to important historical developments, especially as they relate to the China of today. The political, ideological, and economic impact of the West on China will be studied, and contemporary events will be analyzed. In course 202 the same will be done, in less detail, for Japan, Korea, Southeast Asia, and the islands of the Western Pacific. Consideration will also be given to the international relations of Eastern Asia and the Pacific, with particular emphasis upon American interests in that region.

ELEMENTARY COLLOQUIAL CHINESE. Daily 9, T Th 12. Mr. HOCKETT. (See Chinese 101, 102, Division of Modern Languages.)

INTRODUCTION TO LITERARY CHINESE. M W F 11. Mr. SHADICK. (See Chinese 201, 212, Division of Modern Languages.)

INTERMEDIATE COLLOQUIAL CHINESE. T Th S 11. Mr. HOCKETT. (See Chinese 203, 214, Division of Modern Languages.)

CHINESE CONVERSATION. Hours to be arranged. Mr. HOCKETT. (See Chinese 205-206, Division of Modern Languages.)

301-302. *CHINESE LITERATURE IN TRANSLATION*. Throughout the year. Credit three hours a term. M W F 10. Mr. SHADICK.

Fall term, 301. Philosophical and Historical Literature. Including Confucian, Taoist, and Buddhist writings.

Spring term, 302. Imaginative Literature. Including poetry, classical prose, fiction, drama, and the new writing of the twentieth century. 301 prerequisite for 302 except with consent of the instructor.

351-352. *READINGS IN CHINESE LITERATURE: CLASSICAL AND MODERN*. Throughout the year. Credit three hours a term. Prerequisite, Chinese 212, or consent of the instructor. Time to be arranged. Mr. SHADICK.

HISTORY OF CHINESE CIVILIZATION. M W F 12. Mr. BIGGERSTAFF. (See History 162; 161 not offered in 1948-1949.)

THE MODERNIZATION OF CHINA. M 2-4. Mr. BIGGERSTAFF. (See History 811; 812 not offered in 1948-1949.)

INTRODUCTION TO FAR EASTERN ART. T Th S 11. Mr. PATTILLO. (See Fine Arts 601-602.)

[NATIVE CULTURES OF SOUTHEAST ASIA AND THE PACIFIC. Mr. SHARP. (See Sociology and Anthropology 603.) Not offered 1948-1949.]

[THE MODERNIZATION OF SOUTHEAST ASIA AND THE PACIFIC. Mr. SHARP. (See Sociology and Anthropology 604.) Not offered 1948-1949.]

ECONOMICS OF THE FAR EAST. T Th S 10. Mr. REUBENS. (See Economics 801-802.)

[THE FAR EASTERN POLICY OF THE UNITED STATES. Mr. BRIGGS. (See Government 417.) Not offered in 1948-1949.]

951-952. *SEMINAR IN FAR EASTERN STUDIES*. Throughout the year. Credit two hours a term; three hours a term for Far Eastern Studies majors. Open only to qualified seniors and graduate students. T 3-5. STAFF.

Discussion of selected topics concerning contemporary China and other parts of Eastern Asia. Each senior major will meet an additional hour each week with his major adviser, who will assist him to organize his knowledge, fill in gaps by means of a program of supervised reading, and prepare for the comprehensive examination required at the end of the senior year.

THE FINE ARTS

Mr. F. O. WAAGE, *Chairman*; Mr. D. L. FINLAYSON, Mr. N. A. PATTILLO.
Students who wish to do their major work in the Fine Arts will choose one of these two options:

1. *GENERAL COURSE*. In this option the following courses must be completed:

(1) *Aesthetics*, nine hours, namely Psychology 101 and Philosophy 230 and 481.

(2) (a) *Music*, nine hours, including Music 101-102.

(b) *Visual Arts*, nine hours, including Fine Arts 101-102.

(c) *Literature*, nine hours, including Literature 101-102 or 301-302.

(3) Twelve hours of approved advanced courses forming a logically coherent group within one of three fields: (a) *Literature* (literary history, criticism, writing, dramatics); (b) *Visual Arts* (history, practice); (c) *Music* (theory, composition, application).

2. *VISUAL ARTS COURSE.* In this option a student is required to complete (1) *Fine Arts 101-102, 111-112*; (2) eighteen hours of other courses in *Fine Arts*; and (3) fifteen hours in related subjects, including *Psychology 101, Philosophy 230, and History 103-104* or the year course in either ancient, medieval, or modern history. Students electing this option are encouraged, but not required, to elect courses in the practice of art given in the College of Architecture (see the announcement of that College.) A student, however, who, wishing to do graduate work in the practice of art, intends to qualify for admission to the Graduate School as a candidate for the M. F. A. degree, should elect thirty hours of such courses in the practice of art.

GENERAL COURSES

101-102. *INTRODUCTION TO ART.* Throughout the year. Credit three hours a term. Open to all students. M W F 12. Mr. WAAGE.

A survey of the general accomplishments in sculpture and painting of our own culture and those ancestral to it. The first term, which stresses sculpture, comes down to the Renaissance; the second term, which stresses painting, covers the Renaissance and Modern periods. The course attempts to illustrate the evolution of western civilization in terms of its visual arts by showing how art forms arise as a natural consequence of the character of each culture period.

111-112. *INTRODUCTION TO ARCHITECTURE.* Throughout the year. Credit three hours a term. Prerequisite, *Fine Arts 101-102*, or consent of the instructor. Hours to be arranged. Mr. PATTILLO.

This course is complementary to *Fine Arts 101* and *102*.

PRIMITIVE AND ANCIENT

[204. *PRIMITIVE ART: THE ART OF EARLY SOCIETIES.* Spring term. Credit three hours. Open to sophomores who have had *Fine Arts 101-102*, and to upperclassmen without prerequisite. M W F 10. Mr. WAAGE.

The shaping and use of art forms to satisfy the group needs of early cultures wherein art was an indispensable element of every-day life: Old Stone Age Europe, early Egypt, Africa, Australia, and the Americas (Mayas, Incas, etc.); with some consideration of the influence of these primitive and archaic forms on modern art. Not offered in 1948-1949.]

CLASSICAL

301. *GREEK SCULPTURE.* Fall term. Credit three hours. Not open to freshmen. M W F 10. Mr. WAAGE.

A study of the sculpture of the first culture whose artistic forms developed beyond those of the archaic stage; the causes of this advance and the factors which conditioned it. Both the Hellenic and the Hellenistic periods are covered.

302. *ART OF THE ROMAN EMPIRE.* Spring term. Credit three hours. Not open to freshmen. M W F 10. Mr. WAAGE.

[315. *NUMISMATICS: ANCIENT COINAGE.* Spring term. Open to upperclassmen by consent of the instructor. Mr. WAAGE. Not offered in 1948-1949.]

MEDIEVAL

427. *ROMANESQUE AND GOTHIC SCULPTURE.* Fall term. Credit three hours. Not open to freshmen. M W F 11. Mr. FINLAYSON.

Sculpture in the major European countries from 1000 A.D. through the Gothic period. Offered in alternate years.

428. *GOTHIC PAINTING*. Spring term. Credit three hours. Not open to freshmen. M W F 11. Mr. FINLAYSON.

Painting in Italy in the fourteenth century, and in France, Germany, and the Netherlands in the fourteenth and fifteenth centuries. Offered in alternate years.

RENAISSANCE AND MODERN

505. *ITALIAN PAINTING*. Fall term. Credit three hours. Not open to freshmen. T Th S 9. Mr. PATTILLO.

The Renaissance painting of Italy, chiefly of the Florentine and Venetian Schools. Among the major artists whose lives and works will be studied are Fra Angelico, Masaccio, Piero della Francesca, Botticelli, Leonardo, Michelangelo, Raphael, Correggio, Giovanni Bellini, Giorgione, Titian, and Tintoretto.

506. *RENAISSANCE AND MODERN SCULPTURE*. Spring term. Credit three hours. Not open to freshmen. T Th S 9. Mr. PATTILLO.

A study of the main course of development of sculpture in Europe and America from fifteenth century Italy to the present day, with emphasis in each period upon the works of a few representative artists.

511. *AMERICAN PAINTING*. Fall term. Credit three hours. Open to upperclassmen. M W F 2. Mr. FINLAYSON.

Painting in the United States from colonial days to the present.

[525. *SEVENTEENTH AND EIGHTEENTH CENTURY PAINTING*. Fall term. Credit three hours. Not open to freshmen. M W F 11. Mr. FINLAYSON.

Painting of the Baroque and Rococo periods in the major European countries. Offered in alternate years. Not offered in 1948-1949.]

[526. *MODERN PAINTING*. Spring term. Credit three hours. Not open to freshmen. M W F 11. Mr. FINLAYSON.

Nineteenth century painting in France, England, Germany, and the major movements in twentieth century painting. Offered in alternate years. Not offered in 1948-1949.]

FAR EASTERN

601-602. *INTRODUCTION TO FAR EASTERN ART*. Throughout the year. Credit three hours a term. Open to upperclassmen by consent of the instructor. T Th S 11. Mr. PATTILLO.

The architecture, sculpture, and painting of India to the Mohammedan conquest, and the art of China and Japan from the ancient Chinese bronzes to the nineteenth century.

INFORMAL STUDY

029-030. *HISTORICAL SEMINAR IN PAINTING AND SCULPTURE*. Throughout the year. Credit three hours a term. Prerequisite, twelve hours of the History of Art, or the equivalent, and consent of the instructor. Hours to be arranged. Mr. FINLAYSON.

The object of the course is to acquaint students with methods of research in the solution of art historical problems. A larger problem of intrinsic interest which con-

cerns a period, a personality, etc. is treated each term, through division into smaller problems for individual research and report.

PRACTICE OF ART

For courses in the practice of art and in architecture which may be elected by students in the College of Arts and Sciences, see the Announcement of the College of Architecture; these courses may not be counted in the ninety required hours of Arts courses. The following courses in the practice of art are listed here merely for convenience:

PAINTING AND COMPOSITION. (See Architecture 300 and 301 [formerly 309]).

METHODS AND MATERIALS OF PAINTING. (See Architecture 354).

GEOLOGY AND GEOGRAPHY

Mr. W. S. COLE, *Chairman*; Messrs. A. L. ANDERSON, J. D. BURFOOT, Jr., C. M. NEVIN, J. W. WELLS.

Those who are planning careers in Geology, and who seek the recommendation of the Department for graduate study, or for positions, must complete the following courses in Geology for a major: Geology 101-102, 201, 207, 208, 301, 303, 401, 403, 501, 502, 601-602, 605-606, 701-702, 901. In related subjects, of which fifteen hours are required, they must complete Plane Trigonometry, General Chemistry, Introductory Physics, and, if specializing in paleontology, Introductory Zoology. Students in this category should take Geology 101-102 and General Chemistry in their freshman year and should organize their schedules for the major at the beginning of their sophomore year. In addition, the following courses are recommended: Solid Geometry, College Algebra, Analytic Geometry and Calculus, Qualitative Analysis, Quantitative Analysis, Invertebrate Zoology, Elementary Taxonomy and Natural History of Vertebrates, Engineering Drawing, Surveying, Physical Measurements, and Science in Western Civilization. Other courses of value, which should be selected according to the special interests of the student, are: Introduction to Astronomy, Origin of the Solar System, Elementary Meteorology, General Climatology, General Botany, General Biology, The Nature and Properties of Soils, Origin, Morphology, Classification, and Mapping of Soils, Philosophy of Science, Elementary Concepts of Mathematics, Spherical Trigonometry and Map Projections, Physical Chemistry, Advanced Inorganic Chemistry, Colloidal Chemistry, Chemistry of Solids, Chemical Microscopy, Optics and Electronics, Mechanics and Properties of Matter, and Optics. Grades in major and related subjects are expected to be 70 or better.

Those who choose Geology as a major in a general cultural program may satisfy the requirements by completing not less than twenty-four hours in any of the advanced courses in Geology, and fifteen hours of related subjects from any of those listed in the preceding paragraph, and from these additional subjects: Modern Economic Society, The Economics of Dissent, The Distribution of Income, Introduction to sociology and Anthropology, Man and Culture, Population Problems, European History, American History, and American Colonial History to 1763.

COURSES WITHOUT PREREQUISITE

These courses are open to freshmen, and others, without prerequisites.

101-102. **GENERAL GEOLOGY AND PHYSIOGRAPHY: INTRODUCTION TO EARTH SCIENCE.** Throughout the year; cannot be begun in the spring term. Credit three hours a term (if taken after Geology 115, two hours a term). Satisfies the science requirement of College of Arts and Sciences. Intended for underclassmen. May also be taken as a terminal course by upperclassmen who have satisfied the science requirement in the biological sciences. Lectures, T Th 11. Laboratory, M W Th or F 2-4:30. Mr. COLE.

The course comprises an introduction to the various branches of geologic science: mineralogic, lithologic, physiographic, structural, glacial, historic, and economic. The purpose of the course is to provide an adequate base for those who will major in geology and a comprehensive survey of earth science for the general student.

105. **GENERAL GEOGRAPHY.** Fall term. Credit three hours. M W F 9. Mr.——.

A cultural course designed to acquaint the student with the basic elements of geography, together with a regional survey relating countries and productions to the elements and physical factors of geography. Intended to provide adequate conceptual background of world geography for other subjects, history, economics, etc.

107-108. **MINERAL RESOURCES.** Throughout the year. Credit two hours a term. May be begun either term without prerequisite. Intended as a background course for all undergraduates interested in mineral resources for economics, history, government, industry and labor relations, chemistry, etc. T Th 9. Mr. ANDERSON.

A geographic, cultural study of the nature, utilization, occurrence, distribution, production, consumption, reserves, and political and commercial control of the world's important mineral resources. The work of the fall term concerns the non-metals such as coal, petroleum, potash, phosphate, salt, etc.; the work of the spring term deals largely with the metals such as iron, the ferro-alloy metals, copper, lead, zinc, tin, etc.

111. **ANCIENT LIFE.** Spring term. Credit three hours. No prerequisite, but may well be preceded by Geology 101-102, or Geology 115. M W F 10. Mr. WELLS.

A cultural course devoted to a review of the fossil remains of life in the geologic periods as indicative of the continuity of organic evolution. Attention given chiefly to vertebrate forms from fish to man. For major students in Geology the course is a supplement to Geology 601-602.

113. **ENGINEERING GEOLOGY.** Either term. Credit three hours only. Students who have had Geology 101-102 or 115 may take 113 for one hour credit. Lectures, M W 11. Laboratory, M W or T Th 2-4:30. Mr. ANDERSON.

The purpose of the course is to provide a geologic background so that the engineer will be competent to adapt his work to conform with the limitations imposed by geologic conditions.

115. **ELEMENTARY GEOLOGY.** Either term. Credit three hours. Intended for underclassmen in Agriculture, and those in Arts and Sciences who do not plan to major in Geology. This course cannot be used to satisfy the science group requirement of the College of Arts and Sciences. Lectures, T Th 11. Laboratory, M T W Th or F 2-4:30, or S 8-10:30, or S 10:30-1. Mr. NEVIN.

The purpose of the course is to present the fundamental principles of geology with emphasis on the physical aspects.

SECOND COURSES

201. *HISTORIC GEOLOGY*. Fall term. Credit three hours. Prerequisite, Geology 101-102. Lectures, M W 9. Laboratory, W 2-4:30. Mr. WELLS.

The course comprises a systematic study of the geologic history of the earth, with reference to the rock formations, from the earliest periods to the present: their nature and distribution, the orogenies, paleogeography, the fossil remains, and other characteristics on which their identification and correlation depend. Special emphasis is placed on American geology. Field studies, in the laboratory period, will be made in so far as weather and other circumstances permit. This course is designed not only for Geology majors, but also for students desiring a broad view of the physical history of the earth and the development of life through the ages.

205. *ELEMENTARY MINERALOGY*. Fall term. Credit three hours. Prerequisite, General Chemistry. Lectures, T Th 10. Laboratory, Th 2-4:30. Mr. BURFOOT.

For beginners who desire a general knowledge of crystallography and of the commonest minerals, the properties by which they are recognized, their uses, and their significance as constituents of the crust of the earth. In the laboratory, various determinative methods are used for identifying the minerals.

206. *LITHOLOGY*. Spring term. Credit two hours. Prerequisite, Geology 101-102 and 205 (or 207 and 208). Lectures, M 9. Laboratory, F 8-10:30. Mr. BURFOOT.

For geology majors and beginners who desire a general knowledge of igneous, sedimentary, and metamorphic rocks. The mineral composition, classification, identification, modes of origin, and properties of the various kinds of rocks, studied without the use of the petrographic microscope.

207. *CRYSTALLOGRAPHY*. Fall term. Credit three hours; if taken after Geology 205, credit two hours. Prerequisite, General Chemistry or consent of the instructor. Lectures, T Th 11. Laboratory, F 2-4:30. Mr. BURFOOT.

For Geology majors, graduate students, and those who desire a full course in the subject. The principles of crystallography with especial attention given to unique diameters, the thirty-two classes, distorted crystals, and twins.

208. *MINERALOGY*. Spring term. Credit three hours; if taken after Geology 205, credit two hours. Prerequisites, Geology 207 and General Chemistry. Lectures, T Th 11. Laboratory, F 2-4:30. Mr. BURFOOT.

For Geology majors, graduate students, and those who desire a rather full treatment of the subject. The principles of mineralogy and a consideration of the common minerals. Attention is given to the atomic structure of the minerals where feasible. In the laboratory, various methods of determination, including blowpipe methods, are used.

STRUCTURAL GEOLOGY AND SEDIMENTATION

301. *STRUCTURAL GEOLOGY*. Fall term. Credit three hours. Prerequisite, Geology 101-102. Lectures, M W 11. Laboratory, M 2-4:30. Mr. NEVIN.

The purpose of the course is to classify and analyze geologic structures with reference to their nature and origin, and in regard to their use in the interpretation of geologic problems both theoretical and practical.

303. *SEDIMENTATION*. Spring term. Credit three hours. Prerequisite, Geology 101-102. Registration limited. Intended for students who are majoring in Geology

and those interested in the engineering problems related to sedimentation. Lectures, M W 11. Laboratory, M 2-4:30. Mr. NEVIN.

The course comprises a laboratory study of the accumulation and ordering of sediments, together with critical discussions of the problems these present.

321. *PETROLEUM GEOLOGY*. Spring term. Credit three hours. Prerequisite Geology 101-102. For students who intend to enter the oil industry. Lectures, T Th 8. Laboratory, Th 2-4:30. Mr. NEVIN.

The purpose of the course is to acquaint the student with what is known in regard to the origin, distribution, and geology of petroleum and natural gas.

391-392. *SEMINAR IN STRUCTURAL GEOLOGY AND SEDIMENTATION*. Throughout the year. Credit variable. For advanced students. M 4:45. Mr. NEVIN.

395-396. *ADVANCED OR SPECIAL WORK IN SEDIMENTATION, STRUCTURAL, AND PETROLEUM GEOLOGY*. Throughout the year. Credit variable. Intended for advanced and graduate students in Geology. Prerequisite, consent of the instructor. F 9-11:30. Mr. NEVIN.

The purpose of the course is to provide for direction of original investigations essential to the further training of the student in geologic interpretations.

GЕOMORPHOLOGY AND GLACIAL GEOLOGY

401. *GЕOMORPHOLOGY*. Fall term. Credit three hours. Prerequisite, Geology 101-102. Intended for majors in Geology and others interested in the origin and development of the surface forms of the earth. Lectures, T Th 9. Laboratory, T 2-4:30. Mr.———.

The purpose of the course is to provide an explanatory account of the relief of the earth's surface.

403. *GLACIERS AND GLACIATION*. Spring term. Credit three hours. Prerequisite, Geology 101-102. Intended for majors in Geology and Agronomy, and others interested in the phenomena and results of glacierization, especially that of the Pleistocene. Lectures, T Th 9. Laboratory, T 2-4:30. Mr.———.

Living glaciers and the phenomena of the glacial period. Students are required to have one or more Saturdays free for all-day excursions.

495-496. *ADVANCED OR SPECIAL WORK IN GEOGRAPHY, GЕOMORPHOLOGY, OR GLACIAL GEOLOGY*. Credit variable. Prerequisite, consent of the instructor. For advanced and post-graduate students. M 7 P.M. Mr.———.

MINERALOGY AND PETROLOGY

501. *OPTICAL MINERALOGY*. Fall term. Credit three hours. Prerequisite, Geology 205, or 207 and 208. Lecture, M 10. Laboratories, F 8-10:30 and one period to be arranged. Mr. BURFOOT.

For Geology majors and students interested in the use of the petrographic microscope and the identification of substances by means of this instrument. The theory and use of the petrographic microscope in the determination and study of minerals and rocks. The commoner rock-forming minerals are studied in fragments and in thin sections.

502. *PETROGRAPHY*. Spring term. Credit three hours. Prerequisite, Geology 501. Lecture, M 10. Laboratories, F 10:30-1:00 and one period to be arranged. Mr. BURFOOT.

For Geology majors, graduate students, and those who are interested in accurate identification of rocks. A study of the mineral composition, classification, and identification of igneous, sedimentary, and metamorphic rocks by means of the petrographic microscope.

512. *SEDIMENTARY PETROGRAPHY*. Fall term. Credit three hours. Prerequisite, Geology 501. Lectures, M W 9. Laboratory, F 10:30-1:00. Mr. BURFOOT.

Intended for Geology majors and those students interested in the methods of preparation of mineral grains for study and in the identification and interpretation of these grains by means of the petrographic microscope. The methods of investigating the mineral composition, the texture, and other physical characteristics of sedimentary rocks, and some of the applications of these methods to geological problems.

575. *IGNEOUS PETROGENY*. Fall term. Credit three hours. Prerequisite, Geology 502. Lectures, M W 11. Laboratory, S 9-11:30. Mr. BURFOOT.

For advanced Geology majors and graduate students. A study of the principles of petrogeny, the chemistry of magmas, and the origin of and the conditions under which igneous rocks are formed.

577. *METAMORPHIC GEOLOGY*. Spring term. Credit three hours. Prerequisite, consent of the instructor. Lectures, M W 11. Laboratory, S 9-11:30. Mr. BURFOOT.

For advanced students, majors in Geology, and those students in other fields interested in rock transformations and in mineralogic, textural, and structural adjustments to varying conditions of temperature, pressure, and solutions. A general survey of the field of metamorphic geology with especial emphasis on processes and criteria. Metamorphic differentiation, the facies classification of metamorphic rocks, and retrogressive metamorphism are among the subjects considered. Special suites illustrating these phenomena are used.

581. *ATOMIC STRUCTURE OF MINERALS*. Spring term. Credit variable. Prerequisite, consent of instructor. Hours to be arranged. Mr. BURFOOT.

For advanced Geology majors, graduate students, and others with the proper background. A study of the various methods of x-ray analysis and the interpretations and results as applied to minerals.

583. *CRYSTAL MEASUREMENT*. Spring term. Credit variable. Prerequisite, consent of instructor. Hours to be arranged. Mr. BURFOOT.

For advanced Geology majors, graduate students, and those with proper background. The measurement and drawing of crystals, using the single-circle and the two-circle goniometers.

591-592. *SEMINAR IN MINERALOGY AND PETROLOGY*. Throughout the year. Credit one hour a term. Prerequisite, consent of the instructor. W 4:45. Mr. BURFOOT.

Intended for advanced students who desire to study under direction some special topic or method. Literature, special topics, advanced methods. The purpose of this course is to offer to advanced students the opportunity to study, or investigate and to report on some special topic or method.

595-596. *ADVANCED OR SPECIAL WORK IN MINERALOGY AND PETROLOGY*. Throughout the year. Credit variable. Prerequisite, variable. Day and hour to be arranged. Mr. BURFOOT.

Intended for students who wish to do special problems, independent work, or research in mineralogy or petrology. Specialized topics, advanced methods, research.

The purpose of this course is to offer an opportunity for advanced students or those with special interests to work in areas in advance of or not offered in formal courses. Adapted to the needs of the individual student.

PALEONTOLOGY AND STRATIGRAPHY

601-602. *INVERTEBRATE PALEONTOLOGY*. Throughout the year. Credit three hours a term. Prerequisite, Geology 201 and, if possible, Invertebrate Zoology. Intended for students who are majoring in Geology and for students in Biology interested in the fossil evidence of the development of organisms. Lectures. T Th 10. Laboratory, Fall term, Th 2-4:30; Spring term, W 2-4:30. Mr. COLE, Mr. WELLS.

Fall term: paleobiology and classification of important fossil invertebrate organisms; Spring term: key fossils of the geologic periods. Certain laboratory periods will be devoted to the collection and determination of fossil assemblages from selected horizons of the Paleozoic formations of central New York.

605-606. *STRATIGRAPHY*. Throughout the year. Credit three hours a term. Prerequisites, Geology 201 and first term of 601-602. Intended for students majoring in geology. M W F 9. Mr. COLE, Mr. WELLS.

The principles of stratigraphy, developed by detailed study of selected American and European systemic examples. Fall term: the Paleozoic; Spring term: the Mesozoic and Cenozoic.

675. *MICROPALEONTOLOGY*. Spring term. Credit two hours. Prerequisite, consent of the instructor; preparation should include Geology 101-102, 201, 601-602, and 605. Not open to underclassmen. Intended for students who are majoring in Geology, and graduates, especially those who are planning careers in the geology of petroleum deposits. F 10:30-1 and S 8-10:30. Mr. COLE.

Study of the microfossils, chiefly Foraminifera, in their relation to the correlation of strata, as used in the development of oil fields. The course is designed for advanced students in paleontology.

681. *STRATIGRAPHY OF NEW YORK STATE*. Spring term. Credit two hours. Prerequisites, Geology 101-102, 201, 601-602, 605, or consent of the instructor. Intended for upperclassmen and graduates in Geology, and others with the necessary training. The course will be given only if sufficient numbers of qualified students register. Lectures in winter months, all-day field trips in spring months. T Th 12. Mr. WELLS.

The classic Paleozoic section of Central New York will be studied through lectures, readings and field observations.

695-696. *ADVANCED OR SPECIAL WORK IN PALEONTOLOGY AND STRATIGRAPHY*. Throughout the year. Credit variable. Prerequisite, Geology 601-602, and 605. Intended for upperclassmen majoring in Geology, and graduates. W 7 P.M. Mr. COLE.

The purpose of the course is to provide for direction in the study of particular problems in paleontology and stratigraphy, adapted to the needs of the individual student.

ECONOMIC GEOLOGY

701-702. *GENERAL ECONOMIC GEOLOGY*. Throughout the year. Credit three hours a term. Prerequisites, Geology 101-102, or 113, or 115, or consent of the instructor.

tor. Intended for Geology majors, and for Chemistry, Chemical Engineering, and Civil Engineering students interested in industrial source materials. Lectures, T Th 11. Laboratory, F 2-4:30. Mr. ANDERSON.

Nature, mode of occurrence, distribution, and utilization of the more important mineral deposits. The work of the fall term concerns non-metalliferous deposits; the spring term, the metalliferous deposits. Field trips are included as a part of the laboratory work. The purpose of the course is to give the student a geologic background-knowledge of the properties, occurrence, etc., of the minerals and rocks of value to man.

712. *METALLURGICAL RAW MATERIALS*. Spring term. Credit two hours. Intended for students in metallurgical engineering. M W 10. Mr. ANDERSON.

Source, occurrence, association, distribution, and economic aspects of the important ore and fluxing materials that enter metallurgical operations.

721-722. *MICROSCOPIC STUDY OF ORE MINERALS*. Throughout the year. Credit one hour a term. Prerequisite, Geology 205. Intended for advanced students in Economic Geology and Mineralogy. S 9-11:30. Mr. ANDERSON.

Identification of ore minerals in polished sections with reflected light by means of etch and microchemical reactions; study and interpretation of mineral relationships; and preparation of photomicrographs to illustrate paragenesis.

[731-732. *MINERAL EVALUATION AND TECHNOLOGY*. Throughout the year. Credit two hours a term. Prerequisites, Geology 205 and 701-702, or consent of the instructor. Intended for majors in Economic Geology and students in engineering. M W 1. Mr. ANDERSON. Given in alternate years. Not offered in 1948-1949.]

775-776. *GENESIS OF MINERAL DEPOSITS*. Throughout the year. Credit three hours a term. Prerequisites, Geology 501, 701-702, and 721-722. Intended for advanced majors in Economic Geology. Lectures, M W 8. Laboratory, F 9-11:30. Mr. ANDERSON.

Structural occurrence and origin of the economically important mineral deposits. Fall term: the deposits of primary origin associated more or less directly with igneous phenomena; Spring term: the deposits of secondary origin associated more or less directly with processes of weathering and sedimentation.

791-792. *SEMINAR IN ECONOMIC GEOLOGY*. Throughout the year. Credit one hour a term. Registration by invitation of the instructor. Intended primarily for majors and minors in Economic Geology. T 4:45. Mr. ANDERSON.

Seminar designed to keep the student abreast of current advances in the field of Economic Geology.

795-796. *ADVANCED OR SPECIAL WORK IN ECONOMIC GEOLOGY*. Throughout the year. Credit variable. Prerequisites, dependent on nature of the work, but Geology 205, 501 and 701-702 (or 721-722) are ordinarily required. Intended for graduate majors in Economic Geology. T 12. Mr. ANDERSON.

Work designed to meet the needs and training of the student. May include research in Economic Geology, or guided study of advanced or special problems in Economic Geology.

FIELD COURSES

901. *GEOLOGIC MAPPING*. Given at the Summer Field Camp. Credit six hours. Mr. NEVIN.

Instruction in the fundamental methods used in geologic mapping, together with practical work in the field. For students majoring in Geology. Special circular from the department on request.

912. *GEOLOGIC INTERPRETATION OF AERIAL PHOTOGRAPHY*. Spring term. Credit three hours. Prerequisite, Geology 301. Intended for majors in geology. The laboratories and one lecture a week, by arrangement. Mr. WELLS.

Aerial photographs as a substitute for maps; interpretation of geology and preparation of maps from aerial photographs.

GERMAN LITERATURE

Mr. VICTOR LANGE, *Chairman*; Messrs. HEINRICH SCHNEIDER, ———.

The work of the Department of German Literature is concerned with the history and interpretation of the writings of German men of letters and with an understanding of the cultural background and, especially, the language, which these works represent.

The student of German literature is required to have an adequate reading knowledge of German (except in those courses which are open to students in all departments and which present the literature in translation) and will devote himself to the three methodological disciplines of literary studies: (1) history, (2) literary criticism, and (3) the analysis of ideas.

The work of the Department is intended to contribute primarily to a humanistic education and secondarily to the training of teachers and research scholars.

For a major in German Literature the following courses must be completed: (1) in the Division of Modern Languages German 201, 203, or their equivalents; (2) at least twenty-one hours of advanced courses in German Literature, including 300, 301-302, 345, 350, and 365-366; (3) in related subjects, at least fifteen hours selected from the Division of Literature, the Division of Modern Languages, the Classics, Ancient and European History, Philosophy, Romance Literature, and Russian Literature. The student should consult his adviser for the planning of a coherent program.

For additional courses in literature, see the announcement of the Division of Literature.

151-152. *MASTERS OF GERMAN LITERATURE*. Throughout the year. Credit three hours a term. Open to all students. A knowledge of German is not required. Lectures and reading in English. M W F 12. Mr. LANGE.

A survey of German letters in relation to English and European thought. The course stresses the works of certain poets, novelists, and dramatists, and also those German historians and philosophers who have contributed to the intellectual history of Europe and, especially, to the contemporary system of values. The first term will deal with the period to 1870, the second with the contemporary scene and such writers as Thomas Mann, Kafka, and Rilke. Either term may be taken independently of the other.

[300. *THE STUDY OF THE HISTORY OF GERMAN LITERATURE*. Spring term. Credit three hours. M 2-4:30. Mr. SCHNEIDER. Not offered in 1948-1949.]

301-302. *SURVEY OF GERMAN LITERATURE*. Throughout the year. Credit three hours a term. M W F 10. Mr. SCHNEIDER.

The first term will cover the main currents and principal figures of German literature to the end of the fifteenth century; the second term will continue this study to the period of Enlightenment. Lectures and reading in German.

310. *GERMAN BAROQUE LITERATURE*. Fall term. Credit three hours. M W F 11. Mr. SCHNEIDER.

[315. *GERMAN POETRY FROM GOETHE TO THE PRESENT*. Spring term. Credit three hours. M W F 11. Mr. LANGE. Not offered in 1948-1949.]

316. *THE GERMAN NOVEL FROM GOETHE TO THOMAS MANN*. Fall term. Credit three hours. M W F 10. Mr. ———.

325. *NINETEENTH CENTURY DRAMA*. Spring term. Credit three hours. M W F 11. Mr. SCHNEIDER.

Reading and discussion of select plays by Kleist, Grillparzer, Büchner, Grabbe, and Hebbel.

333. *MODERN GERMAN LITERATURE, 1870-1940*. Fall term. Credit three hours. M W F 2. Mr. ———.

An introduction to the history of ideas and values of the past seventy years and a specific discussion of the representative figures of the period: Nietzsche, Hauptmann, Thomas Mann, Rilke, Hofmannsthal, George, etc.

345. *LESSING'S LIFE AND WORKS*. Spring term. Credit three hours. M W F 12. Mr. SCHNEIDER.

An introduction to the period of Enlightenment as represented in the work of Lessing.

350. *SCHILLER*. Fall term. Credit three hours. M W F 12. Mr. SCHNEIDER.

A study of Schiller's life and writings. The course is conducted in German.

365-366. *GOETHE*. Throughout the year. Credit three hours a term. M W F 9. Mr. LANGE.

A detailed study of Goethe's work with special emphasis upon his poetry, his prose, and Faust I and II. The intellectual background of Goethe's Europe will be established, and some of his contemporaries will be discussed. Either term may be taken independently of the other.

420. *GERMAN ROMANTICISM*. Spring term. Credit two hours. T 3-5. Open to qualified undergraduates and graduates. Mr. ———.

475-476. *SEMINAR IN GERMAN LITERATURE*. Throughout the year. Credit two hours a term. Open to graduates, majors, and qualified undergraduates. Th 2-4. Fall term: Probleme der deutschen Literaturkritik. Mr. LANGE. Spring term: Sturm und Drang. Mr. SCHNEIDER.

080. *INFORMAL STUDY*. Open to qualified majors. Mr. SCHNEIDER.

090. *INFORMAL STUDY*. Open to qualified majors. Mr. LANGE.

GOVERNMENT

Mr. HERBERT W. BRIGGS, *Chairman*; Messrs. ROBERT E. CUSHMAN, MARIO EINAUDI, ELIAS HUZAR, CLINTON L. ROSSITER.

For a major in Government the following courses must be completed: (1) Government 101 and either Government 102 or 104; (2) eighteen additional hours in the

Department; (3) in related subjects, twenty-four hours selected with the approval of the adviser from courses (other than the introductory courses) in Economics, History, Philosophy, Sociology and Anthropology, Business and Public Administration, Labor and Industrial Relations, and Regional Planning. Of the hours in related subjects, at least twelve must be in History.

Juniors and seniors majoring in the Department who have a grade of 85 or better in one-half of the hours they have passed may take Informal Study in Government.

Candidates for honors in Government will be required to take three hours of Informal Study during each semester of the senior year. They will also be required to pass a comprehensive examination.

Students registered in the combined Arts-Law, Arts-Business and Public Administration, or Arts-Labor and Industrial Relations courses with a major in Government will be required to take (1) Government 101 and either Government 102 or 104; (2) twelve additional hours in the Department; (3) in related subjects, fourteen hours.

AMERICAN GOVERNMENT AND INSTITUTIONS

101. *AMERICAN NATIONAL GOVERNMENT*. Fall term. Credit three hours. Open to all students, although primarily intended for freshmen. Lectures, T Th 2. Discussion sections to be arranged. Mr. CUSHMAN and Mr. ROSSITER.

A general introduction to American national government and politics. Emphasis will be placed upon historical development, organization, powers, and practical working.

102. *STATE AND LOCAL GOVERNMENT*. Spring term. Credit three hours. Open to all students, although primarily intended for freshmen. Lectures, T Th 2. Discussion sections to be arranged. Mr. HUZAR.

American state and local governments, their historical development, organization, powers, and practical working.

213. *CONGRESS: ORGANIZATION AND METHODS OF WORK*. Fall term. Credit three hours. Open to upperclassmen and sophomores who have had Government 101 or 102. M W F 2. Mr. HUZAR.

Problems and practices of membership, organization, and operation of the national legislature.

216. *THE AMERICAN PRESIDENCY*. Spring term. Credit three hours. Open to upperclassmen who have had Government 101 or 102. M W F 11. Mr. ROSSITER.

A study of the presidential office; the constitutional, administrative, and political position of the President; relation to Congress; current problems and proposals.

218. *AMERICAN POLITICAL PARTIES*. Spring term. Credit three hours. Open to sophomores and to upperclassmen. Prerequisite, Government 101. M W F 8. Mr. ROSSITER.

The history, organization, functions, and significance of political parties in the United States.

231-232. *PUBLIC ADMINISTRATION*. Throughout the year. Credit three hours a term. Open to upperclassmen. M W F 10. Mr. HUZAR.

The following topics will be emphasized: efficiency and responsibility in public administration; principles and problems of administrative organization, the civil service, fiscal management, and methods of administrative action.

235. *AMERICAN POLITICAL AND CONSTITUTIONAL THEORY*. Fall term. Credit three hours. Open to upperclassmen. Prerequisite, Government 101, or consent of the instructor. M W F 8. Mr. ROSSITER.

A survey of the development of American political thought with special reference to its influence on constitutional development.

241. *CONSTITUTIONAL LAW: THE AMERICAN FEDERAL SYSTEM*. Fall term. Credit three hours. Open to upperclassmen. Prerequisite, Government 101, or consent of the instructor. T Th S 11. Mr. CUSHMAN.

Judicial interpretation of the Constitution; the nature of judicial review; separation of government powers; relations between state and national governments; construction of national powers.

242. *CONSTITUTIONAL LAW: FUNDAMENTAL RIGHTS AND IMMUNITIES*. Spring term. Credit three hours. Open to upperclassmen. Prerequisite, Government 101, or consent of the instructor. T Th S 11. Mr. CUSHMAN.

Privileges and immunities of citizenship; protection of civil and political rights; the obligation of contracts; due process of law and the equal protection of the laws.

275-276. *SEMINAR IN CONSTITUTIONAL PROBLEMS*. Throughout the year. Credit two hours a term. Open to graduate students and qualified seniors. Hours to be arranged. Mr. CUSHMAN.

286. *SEMINAR IN PUBLIC ADMINISTRATION*. Spring term. Credit two hours. Open to graduate students and qualified seniors. Hours to be arranged. Mr. HUZAR.

A survey of some administrative problems of the American defense.

050. *INFORMAL STUDY*. Mr. ROSSITER. See italicized statement above.

070. *INFORMAL STUDY*. Mr. HUZAR. See italicized statement above.

090. *INFORMAL STUDY*. Mr. CUSHMAN. See italicized statement above.

COMPARATIVE GOVERNMENT AND POLITICAL THEORY

104. *COMPARATIVE GOVERNMENT*. Spring term. Credit three hours. Open to all students, although primarily intended for freshmen. Lectures, T Th 2. Discussion sections to be arranged. Mr. EINAUDI.

A comparative study of basic governmental institutions and processes, with major emphasis on Europe.

[311. *CONSTITUTIONAL GOVERNMENT OF EUROPE*. Fall term. Credit three hours. Open to sophomores and to upperclassmen. T Th S 9. Mr. EINAUDI. Not offered in 1948-1949.]

321. *DEVELOPMENT OF MODERN POLITICAL THOUGHT*. Fall term. Credit three hours. Open to sophomores with consent of the instructor, and to upperclassmen. T Th S 10. Mr. EINAUDI.

Political thought from the sixteenth century to the French revolution: from Machiavelli to Rousseau.

322. *CONTEMPORARY POLITICAL THOUGHT*. Spring term. Credit three hours. Open to sophomores with consent of the instructor, and to upperclassmen. T Th S 10. Mr. EINAUDI.

A study of the major currents in political thought in the nineteenth and twentieth centuries.

331. *PUBLIC CONTROL OF ECONOMIC LIFE*. Fall term. Credit three hours. Open to upperclassmen. T Th S 9. Mr. EINAUDI.

A political and administrative analysis of developments in the field of government intervention in economic life. Both American and European experience will be taken into account, with special emphasis upon nationalization of industry in Europe.

[375-376. *SEMINAR IN POLITICAL THEORY*. Throughout the year. Credit three hours a term. Open to graduate students and qualified seniors. Hours to be arranged. Mr. EINAUDI. Not offered in 1948-1949.]

385-386. *SEMINAR IN COMPARATIVE CONSTITUTIONAL LAW*. Throughout the year. Credit three hours. Open to graduate students and qualified seniors. Hours to be arranged. Mr. EINAUDI.

060. *INFORMAL STUDY*. Mr. EINAUDI. See italicized statement above.

INTERNATIONAL RELATIONS

411. *INTERNATIONAL RELATIONS*. Fall term. Credit three hours. Open to sophomores and upperclassmen. M W F 9. Mr. BRIGGS.

A survey of ethnic, geographical, political, and economic factors in modern international relations.

414. *INTERNATIONAL ORGANIZATION*. Spring term. Credit three hours. Open to sophomores and to upperclassmen. M W F 9. Mr. BRIGGS.

An analysis of international governmental procedures and institutions: international administration; international legislation; power politics and collective efforts to maintain international peace and security; the League of Nations; the United Nations and specialized agencies; the judicial function and the International Court of Justice.

[417. *CONTEMPORARY AMERICAN FOREIGN POLICY: THE FAR EASTERN POLICY OF THE UNITED STATES*. Fall term. Credit three hours. Open to sophomores and to upperclassmen. M W F 9. Mr. BRIGGS. Not offered in 1948-1949.]

[418. *CONTEMPORARY AMERICAN FOREIGN POLICY: THE LATIN AMERICAN POLICY OF THE UNITED STATES*. Spring term. Credit three hours. Mr. BRIGGS. Not offered in 1948-1949.]

441-442. *INTERNATIONAL LAW*. Throughout the year; first term prerequisite to the second. Credit three hours a term. Open to qualified upperclassmen. M W F 12. Mr. BRIGGS.

A systematic study of the nature, development, and judicial application of the principles of international law. Cases, readings, and discussions.

475-476. *SEMINAR IN INTERNATIONAL LAW AND INTERNATIONAL ORGANIZATION*. Throughout the year. Credit two hours a term. Open to graduate students and qualified seniors. Hours to be arranged. Mr. BRIGGS.

080. *INFORMAL STUDY*. Mr. BRIGGS. See italicized statement above. Consult the instructor.

HISTORY

Mr. PAUL W. GATES, *Chairman*; Messrs. KNIGHT BIGGERSTAFF, C. W. DE KIEWIET, E. W. FOX, H. E. GUERLAC, M. L. W. LAISTNER, F. G. MARCHAM, C. P. NETTLES, CARL STEPHENSON, MARC SZEFTTEL.

For a major in History the following courses must be completed: (1) in History, at least thirty hours; (2) in related subjects, at least eighteen hours which shall be determined by the student in consultation with his adviser. Of the hours in related subjects at least six shall be in other than introductory courses.

101. *OUTLINES OF ANCIENT HISTORY; GREECE AND THE NEAR EAST.* Fall term. Credit three hours. M W F 9. Mr. LAISTNER.

102. *OUTLINES OF ANCIENT HISTORY; ROME.* Spring term. Credit three hours. M W F 9. Mr. LAISTNER.

103-104. *ORIGINS OF CONTEMPORARY CIVILIZATION:* A survey of European history from the time of the Greeks to the present. Throughout the year. Credit three hours a term. Open to freshmen and a limited number of sophomores who have not had History 101 and 102 or 107 and 108. T Th S 9. Mr. FOX, other members of the Department, and assistants.

Designed to introduce the basic materials and methods of historical analysis and their application to contemporary problems. A lecture course with weekly section meetings.

105. *MEDIEVAL HISTORY.* Fall term. Credit three hours. Not open to freshmen. M W F 10. Mr. STEPHENSON.

A sketch of the entire medieval period; lectures, reading, map work.

106. *MODERN EUROPEAN HISTORY. 1500-1815.* Spring term. Not open to freshmen. Credit three hours. M W F 10. Mr. STEPHENSON.

A sketch course with lectures, reading, and map work.

[107. *ENGLISH HISTORY TO THE SEVENTEENTH CENTURY.* Fall term. Credit three hours. T Th S 8. Mr. MARCHAM. Not offered in 1948-1949.]

108. *ENGLISH HISTORY, SEVENTEENTH CENTURY TO THE PRESENT.* Spring term. Credit three hours. T Th S 8. Mr. MARCHAM.

147. *HISTORY OF RUSSIA TO 1917.* Fall term. Credit three hours. T Th S 9. Mr. SZEFTTEL.

Beginnings of Russia, evolution of political institutions and social structure under the Empire, economic development, reform and revolutionary action, main cultural trends, external relations.

148. *THE RUSSIAN REVOLUTION AND THE SOVIET PERIOD.* Spring term. Credit three hours. Prerequisite, History 147 or consent of the instructor. T Th S 9. Mr. SZEFTTEL.

Causes of the Revolution and its development. Problems of economic, social, political, and cultural life from October 1917 to the present.

151. *AMERICAN HISTORY, 1607-1861.* Fall term. Credit three hours. M W F 9. Mr. GATES. M W F 11. Mr. NETTELS.

152. *AMERICAN HISTORY, 1861 TO THE PRESENT.* Spring term. Credit three hours. M W F 9. Mr. GATES. M W F 11. Mr. NETTELS.

[161. *HISTORY OF CHINESE CIVILIZATION: TO 1842*. Credit three hours. Mr. BIGGERSTAFF.

A rapid survey of the more significant Chinese cultural developments from earliest times to the beginning of Western influence. Not offered in 1948-1949.]

162. *HISTORY OF CHINESE CIVILIZATION: SINCE 1842*. Fall term. Credit three hours. M W F 12. Mr. BIGGERSTAFF.

A detailed survey of Chinese history since the beginning of Western influence.

165-166. *SCIENCE IN WESTERN CIVILIZATION*. Throughout the year. Credit three hours a term. M W F 11. Mr. GUERLAC.

[211. *GREEK HISTORY, 500-323 B.C.* Fall term. Credit three hours. Prerequisite, History 101, or the equivalent. M W F 11. Mr. LAISTNER. Not offered in 1948-1949.]

212. *THE HELLENISTIC AGE*. Spring term. Credit three hours. Prerequisite, History 101 and 102 or a satisfactory equivalent. M W F 11. Mr. LAISTNER.

213. *THE ROMAN REPUBLIC 133-30 B.C.* Fall term. Credit three hours. Prerequisite, History 101 and 102 or a satisfactory equivalent. M W F 11. Mr. LAISTNER.

[214. *THE ROMAN EMPIRE, 30 B.C.-A.D. 180*. Credit three hours. Mr. LAISTNER. Not offered in 1948-1949.]

309-310. *ECONOMIC AND SOCIAL HISTORY OF EUROPE FROM THE FOURTH TO THE SIXTEENTH CENTURY*. Throughout the year. Credit three hours a term. An advanced course with limited enrollment. Prerequisite, consent of the instructor. Hours to be arranged. Mr. STEPHENSON.

[312. *INTELLECTUAL HISTORY OF EUROPE FROM THE FOURTH TO THE SIXTEENTH CENTURY*. Spring term. Credit three hours. Prerequisite, consent of the instructor. Hours to be arranged. Mr. STEPHENSON. Not offered in 1948-1949.]

[411-412. *FRANCE IN THE SEVENTEENTH AND EIGHTEENTH CENTURIES*. Throughout the year. Credit three hours a term. Mr. DE KIEWIET. Not offered in 1948-1949.]

[421. *THE EUROPEAN REVOLUTION, 1789-1848*. Fall term. W F 2:00-3:30. Mr. FOX. Not offered in 1948-1949.]

423. *MODERNIZATION OF EUROPE*. Fall term. Credit three hours. Prerequisite, any two-term history course numbered in the one-hundreds. W F 2:00-3:30. Mr. FOX.

424. *EVOLUTION OF THE FOURTH FRENCH REPUBLIC*. Spring term. Credit three hours. Prerequisite, any two-term history course numbered in the one-hundreds. W F 2:00-3:30. Mr. FOX.

[426. *ORIGINS OF THE THIRD REICH*. Spring term. W F 2:00-3:30. Mr. FOX. Not offered in 1948-1949.]

451. *HISTORY OF POLAND AND CZECHOSLOVAKIA*. Fall term. Credit three hours. Prerequisite, History 103 and 104, or History 147 and 148, or consent of the instructor. T Th 12, third hour to be arranged. Mr. SZEFTTEL.

Basic problems of Polish and Czechoslovakian history from earliest times to the present with emphasis on the struggle of the two nations for national survival.

452. *HISTORY OF YUGOSLAVIA AND BULGARIA*. Spring term. Credit three hours. Prerequisite, History 103 and 104, or History 147 and 148, or consent of the instructor. T Th 12, third hour to be arranged. Mr. SZEFTTEL.

Great lines of history of the Balkan Slavs in their relation to the Habsburg Empire, Turkey, and Russian Pan Slavism.

[455-456. *INTELLECTUAL HISTORY OF RUSSIA FROM THE SIXTEENTH CENTURY*. Throughout the year. Credit three hours a term. Prerequisite, History 147-148, or consent of the instructor. T Th S 12. Mr. SZEFTTEL.

Evolution of political, religious, educational, literary, and other features of Russian culture, with emphasis on nationalistic and revolutionary thought.

In the second term, which will cover the period since 1900, special attention will be given to liberal, agrarian, socialist, and Marxist ideas, and intellectual and cultural trends under the Soviet government. Not offered in 1948-1949.]

[511. *ENGLISH CONSTITUTIONAL HISTORY TO 1485*. Fall term. Credit three hours. Prerequisite, History 105, History 107, or consent of the instructor. M W F 2. Mr. STEPHENSON. Not offered in 1948-1949.]

[512. *ENGLISH CONSTITUTIONAL HISTORY SINCE 1485*. Spring term. Credit three hours. Prerequisite, History 105 and 106, or 107 and 108. T Th S 11. Mr. MARCHAM. Not offered in 1948-1949.]

[515. *HISTORY OF ENGLAND UNDER THE TUDORS*. Fall term. Credit three hours. Prerequisite, History 107-108, or consent of the instructor. T Th S 11. Mr. MARCHAM.

A study of the principal developments in political, religious, economic, and intellectual history. The reading is primarily in contemporary prose and drama. Not offered in 1948-1949.]

516. *HISTORY OF ENGLAND UNDER THE STUARTS*. Spring term. Credit three hours. Prerequisite, History 107-108, or consent of the instructor. T Th S 11. Mr. MARCHAM.

A study of politics, constitutional issues, overseas expansion, and certain aspects of scientific developments. Readings in contemporary prose and poetry.

[517-518. *HISTORY OF ENGLAND IN THE NINETEENTH AND TWENTIETH CENTURIES*. Throughout the year. Credit three hours a term. Prerequisite, History 107-108, or consent of the instructor. T Th S 11. Mr. MARCHAM. Not offered in 1948-1949.]

711. *AMERICAN COLONIAL HISTORY TO 1763*. Fall term. Credit three hours. For upperclassmen and graduates. M W F 1. Mr. NETTELS.

712. *THE AGE OF WASHINGTON, 1763-1800*. Spring term. Credit three hours. For upperclassmen and graduates. M W F 1. Mr. NETTELS.

The struggle for American independence, the making of the Constitution, the founding of the Federal Government, and the shaping of national policies.

[717. *AMERICAN BIOGRAPHY*. Fall term. Credit three hours. For upperclassmen and graduates. M W F 1. Mr. NETTELS.

Studies in the work and influence of leaders in various fields of activity who are representatives of main factors or trends in American History. Not offered in 1948-1949.]

721-722. *AMERICAN HISTORY: HISTORY OF THE WEST*. Throughout the year. Credit three hours a term. M W F 12. Mr. GATES.

Western migration, internal improvements, agriculture, growth of democracy and nationalism, federal and state relations.

[725-726. *RECENT AMERICAN HISTORY*. Throughout the year. Credit three hours a term. An intensive course for upperclassmen. M W F 12. Mr. GATES. Not offered in 1948-1949.]

[728. *ECONOMIC HISTORY OF THE UNITED STATES*. Spring term. Credit three hours. Mr. GATES. Not offered in 1948-1949.]

811. *MODERNIZATION OF CHINA: PRIOR TO 1911*. Fall term. Credit two hours. Prerequisite, History 161-162, or consent of the instructor. M 2-4. Mr. BIGGER-STAFF.

The impact of Western civilization upon traditional China.

[812. *MODERNIZATION OF CHINA: SINCE 1911*. Credit two hours. Mr. BIGGERSTAFF.

Cultural changes in China since the Revolution of 1911. Not offered in 1948-1949.]

[911-912. *ORIGINS OF MODERN SCIENCE*. Throughout the year. Credit three hours a term. Mr. GUERLAC.

The evolution of certain fundamental scientific concepts studied through original writings. The first semester is devoted to the physical sciences, the second to biology. Not offered in 1948-1949.]

915-916. *SCIENCE AND THE CENTURY OF THE ENLIGHTENMENT*. Throughout the year. Credit three hours a term. Prerequisite, History 165-166 or consent of the instructor. M W F 2. Mr. GUERLAC.

The thought of the 18th century from Bayle and Fontenelle through the French Revolution, with special emphasis upon the influence of scientific ideas.

DIVISION OF MODERN LANGUAGES

Mr. J. M. COWAN, *Director*; Messrs. F. B. AGARD, G. H. FAIRBANKS, R. A. HALL JR., C. F. HOCKETT, W. G. MOULTON, H. E. SHADICK, C. K. THOMAS, and staff.

The system of course numbering is the same for all languages offered by the Division. Courses 101 and 102 in a given language aim at bringing the student to a level of achievement sufficient to enable him to pass the Proficiency Examination and thus fulfill the language requirement for graduation (see p. 18). Students who fail the Proficiency Examination after completion of course 102 may satisfy the language requirement for graduation by completing course 103, which is open only to such students. New students with previous language experience should take the Proficiency Examination upon or before entrance, (1) to determine whether or not their language competence is sufficient to satisfy the language requirement for graduation, (2) failing this, to determine their placement for further language work.

The Division offers major studies in Chinese Language and Linguistics, French Language and Linguistics, General Linguistics, German Language and Linguistics, Russian Language and Linguistics, and Spanish Language and Linguistics. A major consists of eighteen hours of courses in a given language or in Linguistics numbered above 199, Linguistics 201-202, and fifteen hours in related subjects, of which a mini-

num of six hours must be selected from courses numbered above 199 in the literature of that language (see announcements of Department of Far Eastern Studies, Department of German Literature, Department of Romance Literature).

Provisions can be made for a limited number of students to undertake Informal Study.

CHINESE

101. *ELEMENTARY COURSE IN COLLOQUIAL CHINESE.* Fall term. Credit six hours. T Th 12 and M T W Th F S 9.

102. *ELEMENTARY COURSE IN COLLOQUIAL CHINESE.* Spring term. Credit six hours. Prerequisite, Chinese 101. T Th 12 and M T W Th F S 9.

103. *ELEMENTARY COURSE IN COLLOQUIAL CHINESE.* Either term. Credit three hours. Open only to students with credit for Chinese 102, or the equivalent, who have failed the Proficiency Examination. Hours to be arranged.

201. *INTRODUCTION TO LITERARY CHINESE.* Fall term. Credit three hours. Prerequisite, a satisfactory Proficiency Examination, or Chinese 103. M W F 11. Mr. SHADICK.

203. *INTERMEDIATE COLLOQUIAL CHINESE.* Fall term. Credit three hours. Prerequisite, a satisfactory Proficiency Examination, or Chinese 103. T Th S 11. Mr. HOCKETT.

205-206. *CHINESE CONVERSATION.* Throughout the year. Credit one hour a term. Prerequisite, Chinese 102, or 103. Hours to be arranged.

212. *INTERMEDIATE LITERARY CHINESE.* Spring term. Credit three hours. Prerequisite, Chinese 201. M W F 11. Mr. SHADICK.

214. *INTERMEDIATE COLLOQUIAL CHINESE.* Spring term. Credit three hours. Prerequisite, Chinese 203. T Th S 11. Mr. HOCKETT.

ENGLISH LANGUAGE

101-102. *ENGLISH FOR FOREIGNERS.* Throughout the year. Credit six hours a term. Hours to be arranged.

103. *READING COURSE.* Fall term. Credit three hours. Open only to students with credit for English 102 who have failed the Proficiency Examination. Hours to be arranged.

201. *ENGLISH FOR FOREIGNERS.* Fall term. Credit six hours. M T W Th F S 9, T Th 2. Miss PARATORE. A course treating the special problems of students whose native language is not English. Upon recommendation of the Department of English such students may take this course as a substitute for English 111-112.

FRENCH

101. *ELEMENTARY COURSE.* Either term. Credit six hours. Hours as assigned.

102. *ELEMENTARY COURSE.* Either term. Credit six hours. Prerequisite, French 101. Hours as assigned.

103. *ELEMENTARY COURSE.* Either term. Credit three hours. Open only to students with credit for French 102 or the equivalent, who have failed the Proficiency Examination. T Th S 10.

201. *INTERMEDIATE READING COURSE*. Either term. Credit three hours. Prerequisite, a satisfactory Proficiency Examination, or French 103. T Th S 10.

203. *INTERMEDIATE COMPOSITION AND CONVERSATION*. Either term. Credit three hours. Prerequisite, a satisfactory Proficiency Examination, or French 103. M W F 9 or 10, T Th S 9.

214. *ADVANCED COMPOSITION AND CONVERSATION*. Either term. Credit three hours. Prerequisite, French 203. M W F 1.

[232. *The Linguistic Structure of French*. Spring term of 1950 and alternate years. Credit three hours. Prerequisite, proficiency in French and Linguistics 201. M W F 2. Mr. HALL.

Descriptive study and analysis of French linguistic structure. French phonetics and phonemics: the sounds of French with special attention to contrast with English sounds; syllable-structure; stress and intonation. The forms and sequences of forms of the language, studied from the point of view of speech and of its written representation. The results of linguistic analysis contrasted with traditional grammatical description. Lectures, discussion, and exercises.]

241-242. *History of the French Language*. Throughout the year. Offered in 1948-1949 and alternate years. Credit three hours a term. Prerequisite: proficiency in French. M W F 2. Mr. HALL.

The development of French from Latin and Proto-Romance to the medieval language. The rise of the standard language: the Renaissance and modern language. Analysis of changes in sounds and forms. Lectures, discussion, reading, and analysis of texts.

GERMAN

101. *ELEMENTARY COURSE*. Either term. Credit six hours. Hours as assigned.

102. *ELEMENTARY COURSE*. Either term. Credit six hours. Prerequisite, German 101. Hours as assigned.

103. *ELEMENTARY COURSE*. Either term. Credit three hours. Open only to students with credit for German 102, or the equivalent, who have failed the Proficiency Examination. M W F 10.

105. *SCIENTIFIC READING*. Either term. Credit three hours. Prerequisite, German 102. T T S 11.

201. *INTERMEDIATE READING COURSE*. Either term. Credit three hours. Prerequisite, a satisfactory Proficiency Examination, or German 103, or 105. M W F 10.

203. *INTERMEDIATE COMPOSITION AND CONVERSATION*. Either term. Credit three hours. Prerequisite, a satisfactory Proficiency Examination, or German 103, or 105. T T S 10.

212. *ADVANCED READING COURSE*. Either term. Credit three hours. Prerequisite, German 201, or 203. M W F 12.

214. *ADVANCED COMPOSITION AND CONVERSATION*. Either term. Credit three hours. Prerequisite, German 203. T T S 9.

232. *Linguistic Structure of German*. Spring term 1949 and alternate years. Credit three hours. Prerequisites, proficiency in German and Linguistics 201. T Th S 10. Mr. MOULTON.

A study of the sounds, forms, and structure of modern standard German, using phonograph records and a selected text.

[241. *History of the German Language*. Fall term 1949 and alternate years. Credit three hours. Prerequisite, proficiency in German. T Th S 9. Mr. MOULTON.

The relationship of German to other Germanic and Indo-European languages. The development of High German from the earliest texts to modern times. The rise of the standard language; dialects. Analysis of changes in sounds and forms. Lectures, discussion, reading, and analysis of texts.]

[242. *MIDDLE HIGH GERMAN*. Spring term 1950 and alternate years. Credit three hours. Prerequisite, German 241 or German 281, 282. T Th S 9. Mr. MOULTON.

Reading, discussion, and analysis of the language in Middle High German texts.]

281-282. *GOTHIC AND COMPARATIVE GERMANIC LINGUISTICS*. Throughout the year, 1948-1949 and alternate years. Credit three hours a term. T Th S 9. Mr. MOULTON.

Reading, discussion, and analysis of the language of the Gothic Bible. The relationship of Gothic to other Germanic and Indo-European languages. The reconstruction of Primitive Germanic and Primitive Indo-European. Analysis of changes in sounds and forms.

ITALIAN

101. *ELEMENTARY COURSE*. Fall term. Credit six hours. T Th 10 and M T W Th F S 9 or 11.

102. *ELEMENTARY COURSE*. Spring term. Credit six hours. Prerequisite, Italian 101. T Th 10 and M T W Th F S 9.

103. *ELEMENTARY COURSE*. Either term. Credit three hours. Open only to students with credit for Italian 102, or the equivalent, who have failed the Proficiency Examination. M W F 10.

201. *INTERMEDIATE READING COURSE*. Fall term. Credit three hours. Prerequisite, a satisfactory Proficiency Examination, or Italian 103. T Th S 12.

203. *INTERMEDIATE COMPOSITION AND CONVERSATION*. Fall term. Credit three hours. Prerequisite, a satisfactory Proficiency Examination, or Italian 103. M W F 12.

214. *ADVANCED COMPOSITION AND CONVERSATION*. Spring term. Credit three hours. Prerequisite, Italian 203. M W F 12.

LINGUISTICS

201-202. *INTRODUCTION TO THE SCIENTIFIC STUDY OF LANGUAGE*. Throughout the year. Credit three hours a term. M W F 10. Mr. HOCKETT.

A basic introductory course designed to acquaint the student with the methods of systematic observation of language phenomena (linguistics). This course is required for all majors in language and linguistics or general linguistics (see p. 73); it is also a prerequisite, or a concurrent requirement, for Linguistic Analysis 203-204.

203-204. *LINGUISTIC ANALYSIS*. Throughout the year. Credit three hours a term. Prerequisite, Linguistics 201-202, or registration in Linguistics 201 concurrently with the fall term of this course. M W F 9. Mr. HOCKETT.

A training course in the techniques of observation and analysis of descriptive linguistics. *Fall term*: phonetics and phonemics; *Spring term*: morphology and syntax.

205. *FIELD METHODS*. Fall term. Credit three hours. Prerequisite, 204. Hours to be arranged; four class hours a week may be required. Mr. HOCKETT.

A language with which the students have had no previous experience will be analyzed, on the basis of data gathered in class directly from an informant. The psychological, cultural, and linguistic problems of field method will be discussed as they arise.

211-212. *ACOUSTICAL PHONETICS*. Throughout the year. Credit three hours a term. Hours to be arranged. Mr. COWAN.

A rapid survey of the techniques of experimental articulatory phonetics; the speech mechanism as a sound generator; sound recording techniques, and the methods of general acoustics; application of acoustical analysis to the study of speech sounds. The course will require no mathematical training of the students beyond arithmetical computation; the necessary mathematical operations for acoustical analysis will be developed for the students by the instructor.

281-282. *THE COMPARATIVE STUDY OF ROMANCE LANGUAGES*. Throughout the year. Credit three hours a term. Hours to be arranged. Mr. HALL.

The family of Romance languages; the application of the comparative method and the reconstruction of Proto-Romance speech. The relation between Proto-Romance and Old and Classical Latin. The history of the Romance Languages as a whole from Latin times to the present, and their inter-relationships. A survey of the accomplishments and approaches of recent work in Romance linguistics. Lectures, discussion, and exercises.

OLD ENGLISH PROSE AND POETRY. (See English 305-306).

ENGLISH PHONETICS. (See Speech and Drama 333).

PRINCIPLES OF PHONETICS. (See Speech and Drama 334).

REGIONAL PHONETICS. (See Speech and Drama 336).

HISTORY OF THE LATIN LANGUAGE. (See Classics 347).

VULGAR LATIN. (See Classics 348).

COMPARATIVE GRAMMAR OF GREEK AND LATIN. (See Classics 350).

ITALIC DIALECTS: OSCAN AND UMBRIAN. (See Classics 390).

OLD AND MIDDLE ENGLISH. (See English 605-606).

For other courses in the linguistics of specific languages see French 232, 241, 242; German 232, 241, 242, 281; Russian 232, 241, 290; Spanish 232, 241, 242.

PORTUGUESE

101. *ELEMENTARY COURSE IN BRAZILIAN PORTUGUESE*. Fall term. Credit six hours. T Th 11 and M T W Th F S 12.

102. *ELEMENTARY COURSE IN BRAZILIAN PORTUGUESE*. Spring term. Credit six hours. Prerequisite, Portuguese 101. T Th 11 and M T W Th F S 12.

103. *ELEMENTARY COURSE IN BRAZILIAN PORTUGUESE*. Spring term. Open only to students with credit for Portuguese 102, or the equivalent who have failed the Proficiency Examination.

[201. *INTERMEDIATE READING COURSE*. Fall term. Credit three hours. Prerequisite, a satisfactory Proficiency Examination, or Portuguese 103. Not offered in 1948-1949.]

203. *INTERMEDIATE COMPOSITION AND CONVERSATION*. Fall term. Credit three hours. Prerequisite, a satisfactory Proficiency Examination, or Portuguese 103. Hours to be arranged.

[214. *ADVANCED COMPOSITION AND CONVERSATION*. Spring term. Credit three hours. Prerequisite, Portuguese 203. Not offered in 1948-1949.]

RUSSIAN

101. *ELEMENTARY COURSE*. Fall term. Credit six hours. Hours as assigned.

102. *ELEMENTARY COURSE*. Spring term. Credit six hours. Prerequisite, Russian 101. Hours as assigned.

103. *ELEMENTARY COURSE*. Either term. Credit three hours. Open only to students with credit for Russian 102, or the equivalent, who have failed the Proficiency Examination. T Th S 9.

201. *INTERMEDIATE READING COURSE*. Fall term. Credit three hours. Prerequisite, a satisfactory Proficiency Examination, or Russian 103. M W F 10.

203. *INTERMEDIATE COMPOSITION AND CONVERSATION*. Fall term. Credit three hours. Prerequisite, a satisfactory Proficiency Examination, or Russian 103. T Th S 10.

212. *ADVANCED READING COURSE*. Spring term. Credit three hours. Prerequisite, Russian 201, or 203. M W F 10.

214. *ADVANCED COMPOSITION AND CONVERSATION*. Spring term. Credit three hours. Prerequisite, Russian 203. T Th S 10.

232. *THE LINGUISTIC STRUCTURE OF RUSSIAN*. Spring term. Credit three hours. Prerequisite, proficiency in Russian and Linguistics 201. M W F 2. Mr. FAIRBANKS.

A descriptive study and analysis of Russian linguistic structure. Russian phonetics, phonemics, morphology, and syntax.

241. *HISTORY OF THE RUSSIAN LANGUAGE*. Fall term. Credit three hours. Prerequisite, proficiency in Russian. M W F 2. Mr. FAIRBANKS.

The study of the divisions of the Russian language chronologically and geographically; the relationships of the Russian language, the Slavic group, the Indo-European group; the changes in the sounds and forms of the Russian language; vocabulary borrowings from Eastern and Western languages.

SPANISH

101. *ELEMENTARY COURSE*. Either term. Credit six hours. Hours as assigned.

102. *ELEMENTARY COURSE*. Either term. Credit six hours. Prerequisite, Spanish 101. Hours as assigned.

103. *ELEMENTARY COURSE*. Either term. Credit three hours. Open only to students with credit for Spanish 102, or the equivalent, who have failed the Proficiency Examination. T Th S 9.

201. *INTERMEDIATE READING COURSE*. Either term. Credit three hours. Prerequisite, a satisfactory Proficiency Examination, or Spanish 103. T Th S 9.

203. *INTERMEDIATE COMPOSITION AND CONVERSATION*. Either term. Credit three hours. Prerequisite, a satisfactory Proficiency Examination, or Spanish 103. M W F 9 or 11, T Th S 11.

214. *ADVANCED COMPOSITION AND CONVERSATION*. Either term. Credit three hours. Prerequisite, Spanish 203. M W F 2.

[232. *The Linguistic Structure of Spanish*. Spring term of 1950 and alternate years. Credit three hours. Prerequisite, proficiency in Spanish and Linguistics 201. Mr. AGARD.

Descriptive study and analysis of Spanish linguistic structure. Spanish phonetics and phonemics: the sounds of Spanish with special attention to contrast with English sounds; syllable-structure; stress and intonation. The forms and sequences of forms of the language, studied from the point of view of speech and of its written representation. The results of linguistic analysis contrasted with traditional grammatical description. Lectures, discussion, and exercises.]

241-242. *History of the Spanish Language*. Throughout the year. Offered in 1948-1949 and alternate years. Credit three hours a term. Prerequisite; proficiency in Spanish. M W F 1. Mr. AGARD.

The development of Spanish from Latin and Proto-Romance to the medieval language. The rise of the standard language: the Renaissance and modern language. Analysis of changes in sounds and forms. Lectures, discussion, reading, and analysis of texts.

DIVISION OF LITERATURE

Mr. T. G. BERGIN, *Chairman*; Messrs. M. H. ABRAMS, H. D. ALBRIGHT, R. C. BALD, MORRIS BISHOP, HARRY CAPLAN, DAVID DAICHES, G. I. DALE, A. M. DRUMMOND, F. B. FREEMAN, W. H. FRENCH, BAXTER HATHAWAY, G. H. HEALEY, JAMES HUTTON, C. W. JONES, G. M. KIRKWOOD, VICTOR LANGE, F. MINEKA, H. A. MYERS, V. NABOKOV, EDWIN NUNGEZER, B. L. RIDEOUT, W. M. SALE, JR., HEINRICH SCHNEIDER, H. E. SHADICK, FRIEDRICH SOLMSEN, M. W. STEARNS, C. K. THOMAS, H. W. THOMPSON, F. O. WAAGE, C. I. WEIR, JR., H. A. WICHELS.

Students electing the ordinary major in Literature will choose one of the following alternatives: Alternative A. 1. Advanced courses in one national literature, observing approximately the departmental rules for a major (twenty-four hours); 2. In divisional courses (twelve hours); 3. In related subjects: European or appropriate national history (six hours), History of Philosophy or of Philosophical Ideas, or Foundations of Western Thought (six hours), Bible or Classics, whether in translation or in the original (six hours). Alternative B. 1. Advanced courses in one national literature (eighteen hours); 2. In a second literature (Greek 101-203 inclusive, Chinese 201-212 acceptable) (twelve hours); 3. In divisional courses (twelve hours); 4. In related subjects, two of the three groups as stated under Alternative A, 3.

Honors Program. Open to major students especially recommended by advisers or instructors of Literature 101-102. Courses required of candidates: a national literature (eighteen hours); a second literature (twelve hours); in the division (twelve hours);

in related subjects: two of the three groups, as stated under A, 3 above (twelve hours). In addition there will be twelve hours of tutorial work leading to a comprehensive examination. Honors will be granted on the basis of the student's general achievement, with special emphasis on his work in the major subject, tutorials, and comprehensive examination.

For listings of other courses in literature see the announcements of the following Departments: Classics, English, Far Eastern Studies, German Literature, Romance Literature, and Speech and Drama.

101-102. *INTRODUCTION TO LITERATURE.* Throughout the year. Credit three hours a term. First term prerequisite to the second. For freshmen and sophomores who are considering majoring in literature. M W F 8, 9, 12 or 2; T Th S 9, 10. Messrs. DAICHES, FREEMAN, KIRKWOOD, LANGE, and SALE.

A study of narrative prose, drama, and poetry selected from the literature of the world. The purpose of the course is to quicken appreciation of literary values by the analysis of the content and form of masterpieces.

101 will also be offered in the Spring term, primarily for freshmen exempted from English 112. Others will be admitted only by special permission. Consult Mr. SALE. Hours for 101, Spring term: M W F 12, T Th S 9.

201-202. *ENGLISH TRANSLATIONS OF GREEK AND LATIN CLASSICS.* Throughout the year. Credit three hours a term. First term prerequisite to the second. Open to sophomores and upperclassmen. T 2-4 or Th 2-4; and an hour to be arranged. Mr. HUTTON.

Rapid reading in the best translations with emphasis upon Greek masterpieces; for example, the Iliad and the Odyssey, the tragedies of Sophocles, and several dialogues of Plato. Translations from the Latin will be chosen for the bearing of the original works upon modern literature.

211-212. *SURVEY OF MEDIEVAL LITERATURE.* Throughout the year. Credit three hours a term. First term prerequisite to the second. T Th S 9. Mr. C. W. JONES.

A study, in English translations, of the literature of western Europe from the fourth to the fifteenth century, emphasizing the development of modern literary form. Fall term, Romanesque literature; Spring term, Gothic literature, especially Dante.

214. *HUMANISM AND THE RENAISSANCE.* Spring term. Credit three hours. Primarily for upperclassmen. M W F 10. Mr. HUTTON.

Readings, in translation, from Petrarch, Erasmus, Ficino, Machiavelli, and others, designed to bring out typical ideas and attitudes of the Renaissance period.

301-302. *DRAMA AND THE THEATRE.* Throughout the year. Credit three hours a term. T Th S 11. Mr. DRUMMOND and Mr. MYERS.

An introduction to representative types and forms of drama as interpreted in the theatre, designed to increase appreciation of the drama as literature and of the theatre as art-form and social institution. The development of dramatic literature, the distinguishing qualities of its chief types (tragedy, comedy, melodrama, farce), and the basic principles of dramaturgy will be illustrated by ancient and modern plays. This survey will be paralleled by tracing the development of the physical stage, and of the changing theories and techniques of theatrical production in the important stylistic periods from the Greeks to the present.

311-312. *EUROPEAN FICTION.* Throughout the year. Credit three hours a term. M W F 12. Mr. WEIR.

Selected English, French, German, and Russian novels of the eighteenth and nineteenth centuries will be read. Special attention will be paid to the transmission of ideas and the development of trends in European fiction. All foreign novels will be read in English translation.

401-402. *PRINCIPLES OF LITERARY CRITICISM*. Throughout the year. Credit three hours a term. Fall term, M 2-4 or W 2-4, Mr. CAPLAN. Spring term M W F 2, Mr. DAICHES.

Theories of literary art. In the fall term, consideration will be given to Greek and Roman criticism; in the spring term, to criticism from the Renaissance to the present day.

411. *THE PSYCHOLOGY OF LITERATURE*. Fall term. Credit three hours. Prerequisite, consent of the instructor. T Th S 9. Mr. ABRAMS.

The contributions of present-day psychology to the interpretation of literature and to theories of literary criticism and appreciation.

[421. *MODERN LITERARY CRITICISM*. Spring term. Credit three hours. Prerequisite, consent of the instructor. M W F 10. Mr. SALE. Not offered in 1948-1949.]

MATHEMATICS

Mr. R. P. AGNEW, *Chairman*; Messrs. WILLIAM FELLER, W. W. FLEXNER, W. A. HURWITZ, B. W. JONES, MARK KAC, HARRY POLLARD, J. B. ROSSER, R. J. WALKER.

For a major in Mathematics, the following courses must be completed: (1) in Mathematics, at least fifteen hours of courses numbered above 201; (2) in related subjects, at least fifteen hours to be selected from approved courses in Astronomy, Chemistry, Economics, Education, French, German, Italian, Philosophy, and Physics.

Students planning to teach mathematics in secondary schools should make themselves familiar with the New York State requirements. They should bear in mind that the teaching of mathematics is frequently combined with teaching of physical science or general science. The Department of Mathematics recommends, as minimum preparation for teaching the subject, Mathematics 171, 172, and six additional hours selected from the following list: Mathematics 173, 201, 341, 401, 501. Students planning to teach primarily mathematics should meet the requirements for a major in the subject.

Students wishing to take any of the courses numbered above 173 are invited to confer, before registering, with instructor concerned.

Of courses 111 to 173, not more than six hours may be taken simultaneously without the special permission of the Department.

111. *BASIC MATHEMATICS*. Either term. Three hours a week, one hour credit. Time to be announced later.

A review course in arithmetic and algebra, for those freshmen who have not passed the proficiency examination in the subjects, or who wish a refresher course before taking College Algebra, Trigonometry, or Calculus.

121-122. *ELEMENTARY CONCEPTS OF MATHEMATICS*. Throughout the year. Credit three hours a term. Prerequisite, Mathematics 111 or the equivalent. Time to be announced later.

This course is intended mainly for students who are not planning to continue the study of mathematics. Primary emphasis will be placed on the fundamental ideas common to all mathematics rather than on the technique of any one part of the subject. The student will be encouraged to apply the logical processes of mathematics to problems arising in everyday experience. Extensive skill in the manipulation of mathematical symbols will not be emphasized. Although this course is not designed to satisfy prerequisites for courses in Analytic Geometry and Calculus, a student who has passed it with a sufficiently high grade may be admitted to such courses.

129. *SOLID GEOMETRY*. Either term. Credit three hours, except for students offering Solid Geometry for entrance. Prerequisite, Plane Geometry. Time to be announced later.

131. *COLLEGE ALGEBRA*. Either term. Credit three hours. This course is not intended as preparation for Calculus nor as a refresher course, for students who are weak in Algebra. Students without thorough preparation in Intermediate Algebra are advised to take Mathematics 111 before taking Mathematics 131. Prerequisite, Intermediate Algebra. Time to be announced later.

133. *PLANE TRIGONOMETRY*. Either term. Credit three hours, except for students offering Trigonometry for entrance. Students without thorough preparation in Intermediate Algebra are advised to take Mathematics 111 before taking Mathematics 133. Prerequisite, Plane Geometry and Intermediate Algebra. Time to be announced later.

153-154. *MATHEMATICS FOR SOCIAL AND BIOLOGICAL SCIENCES*. Throughout the year. Credit three hours a term. Prerequisite, Mathematics 111, or the equivalent. Time to be announced later.

Covers those parts of analytic geometry and calculus which are of greatest importance in statistics and various applications in economics, sociology, psychology, biology, etc. Emphasis is on conceptual understanding. This course is not intended to satisfy prerequisites for courses in Mathematics, Physics, Chemistry, Architecture, or Engineering. Mathematics 154 will serve as prerequisite for Mathematics 711.

161-162-163. *ANALYTIC GEOMETRY AND CALCULUS*. Three terms; each course is offered each term. Credit three hours a term. Primarily for students in the College of Engineering; the prerequisites for such students are Mathematics 133 and Mathematics 129 or 131, or the equivalent. For students in the College of Arts and Sciences, the prerequisites for Mathematics 161 are the same as those stated below for Mathematics 171. Time to be announced later.

171-172-173. *ANALYTIC GEOMETRY AND CALCULUS*. Three terms; each course is offered each term. Credit three hours a term. Primarily for students in the College of Arts and Sciences. Prerequisite, Mathematics 133, or the equivalent, and a thorough preparation in Intermediate Algebra. Students without thorough preparation in Intermediate Algebra are advised to take Mathematics 111 before taking Mathematics 171. Some students interested in Mathematics or allied subjects will be expected to take 171, 172, and 173. Time to be announced later.

201. *ELEMENTARY DIFFERENTIAL EQUATIONS*. Either term. Credit three hours. Prerequisite, Mathematics 173, or the equivalent. Time to be announced later.

321. *GROUPS, RINGS, AND FIELDS*. Fall term. Credit three hours. Prerequisite, Mathematics 173 or the equivalent. T Th S 9. Mr. YOOD.

An elementary course dealing with the simpler theorems of group theory and their extension to rings and fields.

361. *THEORY OF EQUATIONS*. Spring term. Credit three hours. Prerequisite, Mathematics 173 or the equivalent. T Th S 9. Mr. YOOD.

Roots of unity, constructions with ruler and compasses, methods of isolating and approximating roots of equations.

371-372. *MODERN ALGEBRA*. Throughout the year. Credit three hours a term. Prerequisite, Mathematics 173 or the equivalent. T Th S 9. Mr. JONES.

An introductory course in modern algebra, serving as a basis for further work in algebra and geometry.

381. *FOUNDATIONS OF MATHEMATICS*. Fall term. Credit three hours. Prerequisite, at least three semester hours of mathematics beyond the calculus. M W F 10. Mr. ROSSER.

A careful study of a system of symbolic logic; its value in furnishing a test for the validity of mathematical reasoning will be stressed.

382. *SYMBOLIC LOGIC*. Spring term. Credit three hours. Prerequisite, a knowledge of Mathematics 381 or its equivalent. M W F 10. Mr. ROSSER.

A study of advanced topics in Symbolic Logic. Applications to mathematical reasoning will be stressed.

401-402. *PROJECTIVE GEOMETRY*. Throughout the year. Credit three hours a term. Prerequisite, Mathematics 173 or the equivalent. M W F 9. Miss WILLIAMS.

A first course in projective geometry, including both synthetic and analytic methods.

413. *POINT SET TOPOLOGY*. Fall term. Credit three hours. Prerequisite, Mathematics 173 or the equivalent and, in the case of undergraduates, the consent of the instructor. M W F 9. Mr. TUCKERMAN.

An introduction to the study of topological spaces, including connectedness, compactness, product spaces, and applications such as the metrization theorem and the fundamental group.

414. *COMBINATORIAL TOPOLOGY*. Spring term. Credit three hours. Prerequisite, Mathematics 413 and either Mathematics 321 or Mathematics 371. M W F 9. Mr. FLEXNER.

For graduate students and qualified undergraduates. The course will include proofs of the topological invariance of homology groups and the Poincaré duality theorem.

431. *DIFFERENTIAL GEOMETRY*. Spring term. Credit three hours. Prerequisite, Mathematics 173 or the equivalent. M W F 12. Mr. FLEXNER.

Primarily for undergraduates. An introduction to the study of curves and surfaces in Euclidean 3-space, and to the use of tensors.

501-502. *ADVANCED CALCULUS*. Throughout the year. Credit three hours a term. Prerequisite, Mathematics 173, or the equivalent. M W F 11. Mr. AGNEW.

A careful study of limits, continuity, derivatives, and Riemann integrals. Functions of several variables. Multiple and line integrals. The course is designed to furnish necessary preparation for advanced work in analysis and applied mathematics. Emphasis is placed on the logical development of the calculus, rather than on a wide range of formal applications.

511-512. *REAL FUNCTIONS*. Throughout the year. Credit three hours a term. Prerequisite, Mathematics 502 or the equivalent. T Th S 11. Mr. HURWITZ.

Among the topics considered will be real numbers, Euclidean spaces, abstract spaces, transfinite numbers, sets, point functions, and set functions. Particular emphasis will be placed on the Lebesgue theory of measure, the Lebesgue and related integrals, and theories of measure in abstract spaces.

537. *FOURIER AND LAPLACE TRANSFORMS*. Fall term. Credit three hours. Prerequisite, consent of teacher. M W F 12. Mr. POLLARD.

A rigorous treatment of the inversion and representation problems, with applications to differential operators of finite and infinite order.

581. *CALCULUS OF VARIATIONS*. Spring term. Credit three hours. Prerequisite, Mathematics 502 or the equivalent. M W F 12. Mr. POLLARD.

An introduction to the standard theory of maxima and minima of integrals, with applications to geometry and mechanics.

605. *NUMERICAL AND GRAPHICAL METHODS*. Spring term. Credit three hours. Prerequisite, Mathematics 201, or the equivalent. M W F 10. Mr. TUCKERMAN.

Graphs, scales, and alignment charts; analytical approximations to empirical curves; interpolation and extrapolation; mechanical quadratures; numerical and graphical solutions of algebraic, transcendental, and differential equations. Applications to problems in chemistry, physics, and engineering will receive special attention.

607. *APPLIED MATHEMATICS FOR ELECTRICAL ENGINEERS*. Spring term. Credit three hours. Prerequisite, Mathematics 163 or the equivalent.

Complex numbers, determinants, Fourier series, solution of algebraic and transcendental equations, vector algebra, theory of errors, and dimensional analysis.

608. *DIFFERENTIAL EQUATIONS FOR ELECTRICAL ENGINEERS*. Fall term. Credit three hours. Prerequisite, Mathematics 607.

A course in ordinary differential equations with special emphasis on problems of electrical engineering.

611-612. *HIGHER CALCULUS FOR ENGINEERS AND PHYSICISTS*. Throughout the year. Credit three hours a term. Prerequisite, Mathematics 173 or the equivalent. T Th S 10. Mr. WALKER.

Infinite series, partial differentiation, multiple and line integrals, Fourier series, partial differential equations, vector analysis, complex variables, orthogonal expansions, calculus of variations, Laplace and Fourier transforms with applications. Emphasis is placed on a wide range of formal applications of the calculus, rather than on the logical development. The second term will be accepted as prerequisite to Complex Variables.

621-622. *MATHEMATICAL METHODS IN PHYSICS*. Throughout the year. Credit three hours a term. Prerequisite, Mathematics 201, or the equivalent, and at least two years of general physics. M W F 12. Mr. ROSSER.

Lectures and problem work designed to give the students a working knowledge of the principal mathematical methods used in advanced physics.

681-682. *DIFFERENTIAL EQUATIONS OF MATHEMATICAL PHYSICS*. Throughout the year. Credit three hours a term. Prerequisite, Mathematics 502. M W F 11. Mr. HURWITZ.

The derivation of the differential equations, with appropriate boundary conditions, which arise in certain problems of mathematical physics; the mathematical properties of solutions, and the physical meanings of these properties.

711-712. *STATISTICS*. Throughout the year. Credit three hours a term. Prerequisite, Mathematics 154 or 172 or the equivalent. T Th S 11. Mr. KAC.

721-722. *PROBABILITY*. Throughout the year. Credit three hours a term. Prerequisite, Mathematics 173 or the equivalent. T Th S 10. Mr. KAC.

Random variables and their distribution functions. Characteristic functions. The central limit theorem. Random value problems. Markoff chains. Theory of Brownian motion and other applications to physics.

723-724. *ADVANCED PROBABILITY*. Throughout the year. Credit three hours a term. Prerequisite, consent of instructor. T Th 2:30-4.00. Mr. FELLER.

Selected topics of the advanced theory of probability.

READING, RESEARCH, AND INFORMAL STUDY

For properly qualified students, members of the Department will direct reading and research not necessarily associated with any course.

031. *READING IN ALGEBRA*.

041. *READING IN GEOMETRY*.

051. *READING IN ANALYSIS*.

061. *READING IN APPLIED MATHEMATICS*.

071. *READING IN PROBABILITY AND STATISTICS*.

MUSIC

Mr. DONALD J. GROUT, *Chairman*; Messrs. WILLIAM AUSTIN, WILLIAM CAMPBELL, ROBERT HULL, JOHN KIRKPATRICK, ROBERT PALMER, and Mrs. MARGARET SQUIRE.

For a major in music, the following must be completed: (1) (a) four hours in Music 401, 402, and (b) Music 101, 102, 201, 202; 203-204; 301, 302; 319, 320; and (c) six hours from Music 303 through 312; (2) in related subjects, a minimum of fifteen hours to be chosen with the approval of the adviser; (3) at least two years' membership and participation in either the University Orchestra, the Sage Chapel Choir, the Cornell A Cappella Chorus, or the Concert Band.

Students who are considering music as a possible major field should consult the chairman of the Department at the beginning of their freshman year or as soon thereafter as possible.

A large collection of recorded music and scores is housed in the Music Building at 320 Wait Avenue, where a number of phonograph listening rooms are available. These facilities may be used by any member of the student body at hours to be announced each term.

Choral and instrumental ensembles are trained and directed by members of the departmental staff each term, and all students who are interested are invited to join these groups. These ensembles include the Sage Chapel Choir, the Cornell A Cappella Chorus, the Men's and Women's Glee Clubs, the Bands, the Orchestra, and

Chamber Music Groups. Announcements of tryouts will be made at the beginning of each term. For rehearsal hours, see the hours listed for Music 405 through 412.

MUSIC THEORY

103-104. *THEORY I: THE FUNDAMENTALS OF MUSIC.* Throughout the year. Credit three hours a term. M through F 8, or M through F 9. Mr.———.

A study of the fundamentals of music through ear training, use of the keyboard, and simple part writing. Includes scales, triads, intervals, and keys; rhythmic, harmonic, and melodic dictation; sight-singing, writing of melody and simple four-part harmony, and developing facility at the keyboard.

201-202. *THEORY II: HARMONY.* Throughout the year. Credit three hours a term. Prerequisite, Music 103-104, or the equivalent. M W F 10. Mr.———.

A study of harmonic principles of the period of common practice (1700-1900). The materials and techniques of the period will be practiced through writing, hearing, analysis, playing, and composition in the simpler homophonic forms.

203-204. *THEORY III: COUNTERPOINT.* Throughout the year. Credit three hours a term. Prerequisite, Music 201-202, or the equivalent. M W F 12. Mr. PALMER.

The general principles of counterpoint will be studied by examining the contrapuntal practice of the Baroque period as exemplified chiefly in the works of J. S. Bach. There will be analysis and composition in the polyphonic forms of the period.

205-206. *THEORY IV: ANALYTIC TECHNIQUE.* Throughout the year. Credit three hours a term. Prerequisite, Music 203-204, or the equivalent. M W 10-12. Mr. PALMER.

The course is designed to develop a technique of analysis applicable to the music of any period. Examples from various periods in the history of music will be intensively studied, and the growth of the important structural principles underlying Western music will be traced.

207-208. *ORCHESTRATION AND CONDUCTING.* Throughout the year. Credit three hours a term. Prerequisites, Music 101-102 and 103-104, or the equivalents. M W 2-3:30. Mr. CAMPBELL.

A study of the instruments of the orchestra and their use in representative works from 1700 to the present. The fundamentals of score reading and conducting. Qualified students will be given opportunity to practice with university musical organizations.

021-022. *INFORMAL STUDY.* Credit hours to be arranged. Mr. PALMER.

023-024. *INFORMAL STUDY.* Credit hours to be arranged. Mr. HULL.

MUSIC HISTORY

101-102. *THE ART OF MUSIC.* Throughout the year. Credit three hours a term. Open to all students. First term is prerequisite to the second. Students who are considering music as a possible major field should register for this course in their freshman year. M W F 11. Mr. AUSTIN.

An approach to the understanding and rational enjoyment of the art of music, offered especially for students who have had no technical training in the subject. The first term covers a study of the elements of music, the media of musical expres-

sion, and musical forms. The second term covers a study of the work of representative composers in relation to their social and artistic environment. Most of the outside work in this course consists of attending concerts and studying phonograph records.

301-302. *HISTORY OF MUSIC*. Throughout the year. Credit three hours a term. Prerequisites, Music 101-102 and 201-202 (the latter may be taken concurrently with Music 301-302). M W F 9. Mr. GROUT.

The development of the art of music from the Middle Ages to the present, with a study of compositions representative of the principal styles.

313. *PIANO MUSIC*. Spring term. Credit three hours. Prerequisite, Music 101-102, or the equivalent. M W F 11. Mr. KIRKPATRICK.

A survey of the literatures of the modern piano and its forerunners, emphasizing the relation of keyboard styles to the changing musical scene.

[303-304. *MUSIC OF THE RENAISSANCE*. Throughout the year. Credit three hours a term. Prerequisites, Music 201-202 and 301-302. M W F 10. Mr. GROUT. Not offered in 1948-1949.]

[305-306. *MUSIC OF THE BAROQUE PERIOD*. Throughout the year. Credit three hours a term. Prerequisites, Music 201-202 and 301-302. M W F 10. Mr. GROUT. Not offered in 1948-1949.]

307-308. *MUSIC OF THE CLASSICAL PERIOD*. Throughout the year. Credit three hours a term. Prerequisites, Music 101-102 and 301-302. M W F 10. Mr. GROUT.

The development of musical styles and forms from the early eighteenth century to the beginning of the Romantic period, with emphasis on the works of Haydn, Mozart, and Beethoven.

[311-312. *CONTEMPORARY MUSIC*. Throughout the year. Credit three hours. Prerequisites, Music 301-302 and 203-204. (The latter may be taken concurrently with Music 311-312.) M W F 12. Mr. PALMER. Not offered in 1948-1949.]

319-320. *COLLEGIUM MUSICUM*. Throughout the year. Credit two hours a term. Prerequisites: Music 101-102 or Music 103-104; and consent of the instructor. Required of all music majors for at least two years, usually in the junior and senior years. A student may register for this course in successive years but may not receive more than eight hours' credit for this course. T 2-4:40. Mr. HULL, assisted by members of the department.

A study of selected works from all periods in the history of music through analysis, editing, conducting, and performing. Each member of the class will be assigned specific research problems which will be the basis of performances and discussions during the laboratory section of the regular class period. The techniques and objectives will be the same each year, but the materials covered will not be the same in any two successive years.

031-032. *INFORMAL STUDY*. Credit hours to be arranged. Mr. AUSTIN.

033-034. *INFORMAL STUDY*. Credit hours to be arranged. Mr. GROUT.

041-042. *INFORMAL STUDY*. Credit hours to be arranged. Mr. KIRKPATRICK.

APPLIED MUSIC

401-402. *INDIVIDUAL INSTRUCTION IN VOICE; ORGAN; PIANO; STRING, WOODWIND, AND BRASS INSTRUMENTS*. Throughout the year. Each course,

for two half-hour lessons a week, carries two hours' credit a term, provided that the student shall have earned double that number of credits in music courses other than those in the 400 category. A student may register for this course in successive years. Open to all students by permission of the instructor. Students should consult the instructor at the beginning of each term as to hours for instruction, and the secretary of the Department as to hours for the use of practice rooms. Messrs. AUSTIN, CAMPBELL, HULL, KIRKPATRICK, Mrs. SQUIRE, Mr.———.

For violin and viola instruction with Mr. HULL, for piano instruction with Mrs. SQUIRE, for instruction in woodwind and brass instruments with Mr. CAMPBELL, and for organ instruction with Mr. AUSTIN, there is a fee of \$30 for one half-hour lesson a week each term. For piano instruction with Mr. KIRKPATRICK, there is a fee of \$50 for one half-hour lesson a week each term. A fee of \$7.50 a term is charged for a daily one-hour assignment to a practice room equipped with a piano. A fee of \$30 a term is charged for a daily one-hour assignment for the use of a pipe organ in Bailey Hall or Barnes Hall.

MUSICAL ORGANIZATIONS AND ENSEMBLES

Throughout the year. Credit one hour for two terms. Registration is permitted in two of these courses simultaneously, and students may register in successive years, but no student may earn more than four hours of credit in these courses.

405-406. *THE SAGE CHAPEL CHOIR.* T 7-8 P.M. and Th 7:30-9 P.M. Mr. GROUT.

407-408. *THE CORNELL A CAPPELLA CHORUS.* M W 4:30-5:30 P.M. Mr. HULL.

409-410. *UNIVERSITY ORCHESTRA.* T 7-8 P.M., strings only, and W 7:30-9:30 P.M., full orchestra. Mr. HULL.

411-412. *UNIVERSITY CONCERT BAND.* Th 7:30-9:30 P.M. and F 4:30-6 P.M. Mr. CAMPBELL.

COURSES PRIMARILY FOR GRADUATES

275-276. *SEMINAR IN COMPOSITION.* Throughout the year. Credit two hours a term. Open to seniors by permission. Hours to be arranged. Mr. PALMER.

The work is intended to make the student acquainted with compositional practices in contemporary styles and to develop the student's creative abilities.

375-376. *INTRODUCTION TO RESEARCH.* Throughout the year. Credit two hours a term. Prerequisites, a reading knowledge of French and German and an elementary knowledge of music theory and general music history. Open to seniors by permission. Hours to be arranged. Mr. GROUT.

The basic materials and techniques of musicological research.

377-378. *SEMINAR IN MUSICOLOGY.* Throughout the year. Credit two hours a term. Hours to be arranged. Mr. GROUT.

This course is primarily for graduates (and, by permission, seniors) who have (1) the requisite knowledge of one or more of the important foreign languages, (2) a fair knowledge of music theory, and (3) some skill in applied music and score reading. A particular topic or field of study will be assigned to each student after consultation.

PHILOSOPHY

Mr. ARTHUR E. MURPHY, *Chairman*; Messrs. MAX BLACK, S. M. BROWN, E. A. BURTT, G. WATTS CUNNINGHAM, NORMAN MALCOLM, HAROLD R. SMART, GREGORY VLASTOS.

For a major in Philosophy, the standard requirement is as follows: (1) in Philosophy twenty-one hours, including Philosophy 225-226 and one advanced course, all to be chosen with the approval of the student's adviser; (2) in related subjects, eighteen hours, to be chosen with the approval of the adviser. This requirement, however, will be diminished by six hours to allow for a final comprehensive examination, if the student elects to take such an examination. The courses thus to be omitted will be determined by the adviser. The major may emphasize aesthetics, social studies, history, logic, or religion. In each case an integrated program of studies must be selected, subject to the approval of the adviser. Informal Study is open to qualified majors.

Students registered in the combined Arts-Law course with a major in Philosophy will be required to complete twelve hours in Philosophy, including Philosophy 225-226, and nine hours in related subjects.

COURSES FOR UNDERCLASSMEN

101. *PHILOSOPHICAL CLASSICS*. Either term. Credit three hours. Open to freshmen. Fall term: M W F 8 or 11, T Th S 9 or 11. Spring term: M W F 10, 11 or 1, T Th S 9. Messrs. BURTT, MALCOLM, SMART, VLASTOS, and ———.

A careful study of Lucretius' *On the Nature of Things*, Plato's *Republic*, and J. S. Mill's *On Liberty*. In studying Plato and Mill, special attention is paid to the philosophy of democracy.

102. *PHILOSOPHICAL CLASSICS: SECOND COURSE*. Either term. Credit three hours. Prerequisite, Philosophy 101. Fall term: M W F 10. Spring term: M W F 8. Messrs. BROWN and MALCOLM.

Reading and discussion of somewhat more advanced texts than those used in Philosophy 101, including Plato, Hume, and Descartes.

103. *LOGIC*. Either term. Credit three hours. Open to freshmen. Fall term: M W F 12, T Th S 9 or 12. Spring term: M W F 12 or 3, T Th S 10 or 12. Messrs. BLACK, MALCOLM, and ———.

An elementary study of valid inference, inductive methods, and the causes of fallacy.

202. *ELEMENTARY SEMANTICS*. Fall term. Credit three hours. Open to sophomores and upperclassmen. M W F 3. Mr. BLACK.

A survey of what is reliably known about the philosophy of language, and symbolism, with detailed practice in interpretation. Topics include: sign-using behavior, the nature of language, special types of discourse (scientific, poetic, mathematical, propagandistic), semantic fallacies. Lectures and discussion.

221-222. *ETHICS*. Throughout the year. Credit three hours a term. First term prerequisite to the second. Open to sophomores and upperclassmen. M W F 11. Mr. BROWN.

Fall term: Basic moral ideas of Western civilization as interpreted by its major philosophers: Greek and Christian Ethics; the rise of modern liberalism, contem-

porary issues. Spring term: The meaning and tests of value judgments; the structure, conditions, and ends of a moral community; application to current social problems. 225-226. *HISTORY OF PHILOSOPHY*. Throughout the year. Credit three hours a term. Open to sophomores and upperclassmen. T Th S 10. Messrs. CUNNINGHAM and VLASTOS.

Occidental philosophical thought from its origin among the Greeks to the present time; the most important systems in their cultural context and their application to social, religious, and educational problems. Fall term: Ancient and Medieval period. Spring term: Modern period.

230. *AESTHETICS: PHILOSOPHY OF ART*. Spring term. Credit three hours. Prerequisite, three hours of Philosophy. Open to students majoring in Philosophy or in Fine Arts, and to others by consent of the instructor. M W F 9. Mr. SMART.

A critical study of certain outstanding theories of art, ancient, modern, and contemporary.

COURSES FOR UPPERCLASSMEN AND GRADUATES

301-302. *HISTORY OF POLITICAL THEORY*. Throughout the year. Credit three hours a term. Open to juniors and seniors. T Th S 11. Mr. VLASTOS.

Fall term: The political philosophy of the city-state—Plato and Aristotle; natural law and the theory of church and state. Spring term: The theory of the national state, and especially the development of the liberal tradition in the seventeenth and eighteenth centuries.

DEVELOPMENT OF POLITICAL THOUGHT. (See Government 321, 322.)

312. *CONTEMPORARY PHILOSOPHY*. Spring term. Credit three hours. Prerequisite, six hours of Philosophy, or consent of the instructor. T Th S 9. Mr.———.

Main tendencies in recent analytic and speculative philosophy with particular reference to instrumentalism, logical positivism, and Whitehead's philosophy of organism.

313. *AMERICAN PHILOSOPHY*. Fall term. Credit three hours. Open to juniors and seniors. M W F 10. Mr. CUNNINGHAM.

The development of American thought from Jonathan Edwards to the present. Puritanism, the Enlightenment, transcendentalism, evolutionary science and religion, the philosophies of Royce, James, Santayana, and Dewey.

321. *HISTORY OF RELIGIONS*. Fall term. Credit three hours. Open to juniors and seniors, and to sophomores by consent of the instructor. M W F 12. Mr. BURTT.

A general survey of the development of ritual, practice, and belief in religions of selected cultures.

322. *PHILOSOPHY OF RELIGION*. Spring term. Credit three hours. Open to juniors and seniors, and to sophomores by consent of the instructor. M W F 12. Mr. BURTT.

A study of the major types of religious belief in the modern world in relation to their philosophical background. Special attention is given to the interaction between religion and democratic ideals.

323. *ADVANCED LOGIC*. Fall term. Credit three hours. Prerequisite, Philosophy 103, or consent of the instructor. M W F 2. Mr. BLACK.

A study of current methods and problems of formal logic, with discussion of relevant philosophical issues: Algebra of classes, propositional calculus, calculus of functions, the logical paradoxes, and the theory of types.

324. *PHILOSOPHY OF SCIENCE*. Spring term. Credit three hours. Prerequisite, six hours of Philosophy or consent of the instructor. M W F 2. Mr. BLACK.

A critical analysis of scientific methodology with detailed study of such topics as causality, theories, fictions, measurement.

[335-336. *HISTORY OF PHILOSOPHICAL IDEAS*. Throughout the year. Credit three hours a term. First term prerequisite to the second. Mr. MURPHY.

The ideas of reason, freedom, and progress. Not offered in 1948-1949.]

426-427. *THEORY OF KNOWLEDGE*. Throughout the year. Credit three hours a term. Open to juniors and seniors. First term prerequisite to the second. M 3-5, W 3. Mr. MALCOLM.

Foundations of empirical knowledge, perception; memory; knowledge of other minds.

[481. *AESTHETICS: ADVANCED COURSE*. Fall term. Credit three hours.

An intensive study of selected problems in the field. Not offered in 1948-1949.]

[485. *PHILOSOPHY OF RELIGION: ADVANCED COURSE*. Fall term. Credit three hours. Mr. BURTT. Given in alternate years.

An intensive study of selected problems in the field, with critical comparison of basic ideas in Judaism, Christianity, and Oriental religions. Not offered in 1948-1949.]

SYMBOLIC LOGIC. (See Mathematics 382.)

[575-576. *PLATO AND ARISTOTLE*. Throughout the year. Credit three hours a term. Given in alternate years.

A philosophical study of the two ancient thinkers, with substantial readings from their works in translation. Not offered in 1948-1949.]

579-580. *MODERN PHILOSOPHERS*. Throughout the year. Credit three hours a term. Th 3-5, or hours to be arranged. Fall term: Kant. Mr. BURTT. Spring term: Hegel. Mr. CUNNINGHAM.

In the fall the *Critique of Pure Reason* and portions of the *Critique of Pure Practical Reason* will be studied; in the spring, the introduction to the *Phenomenology of Mind*, and the smaller *Logic*.

581-582. *SEMANTICS AND LOGIC*. Throughout the year. Credit three hours a term. T 2-4, or hours to be arranged. Mr. BLACK.

Topic for 1948-1949: Foundations of deductive logic and pure mathematics.

585-586. *ADVANCED ETHICS AND VALUE THEORY*. Throughout the year. Credit three hours a term. Open to graduates and seniors by consent of the instructor. First term prerequisite to the second. F 3-5, or hours to be arranged. Messrs. BROWN and VLASTOS.

An intensive study of some of the main problems in ethics and social philosophy.

587-588. *METAPHYSICS*. Throughout the year. Credit three hours a term. W 3-5, or hours to be arranged. Fall term: Problems of Meaning. Mr. CUNNINGHAM. Spring term: The Task of Metaphysics. Mr. BURTT.

An intensive study of some of the main theories and problems regarding reality and knowledge.

590. *SEMINAR IN GREEK PHILOSOPHY*. Fall term. Credit three hours. M 3-5, or hours to be arranged. Mr. VLASTOS. Topic for 1948-1949: Plato's *Laws*.

[592. *SEMINAR IN MODERN PHILOSOPHY*. Spring term. Not given in 1948-1949.]

[595. *SEMINAR IN SEMANTICS AND LOGIC*. Fall term. Mr. BLACK. Not given in 1948-1949.]

[596. *SEMINAR IN THEORY OF VALUE*. Spring term. Not given in 1948-1949.]

[598. *SEMINAR IN METAPHYSICS AND EPISTEMOLOGY*. Fall term. Mr. BURTT. Not given in 1948-1949.]

039. *INFORMAL STUDY*. Open to qualified majors. (See italicized statement p. 89.) Messrs. BLACK, BURTT, CUNNINGHAM, MURPHY, VLASTOS.

049. *INFORMAL STUDY*. Open to qualified majors. (See italicized statement p. 89.) Messrs. BROWN, MALCOLM, SMART.

PHYSICS

Mr. L. P. SMITH, *Chairman*; Messrs. R. F. BACHER (on leave); (C. P. BAKER, Nuclear Studies); L. L. BARNES; H. A. BETHE (on leave first term); D. R. CORSON; E. D. COURANT; (T. R. CUYKENDALL, Engineering Physics); J. W. DE WIRE; R. P. FEYNMAN; C. W. GARTLEIN; G. E. GRANTHAM; K. I. GREISEN; P. L. HARTMAN; H. E. HOWE; J. S. LEVINGER; B. D. McDANIEL; P. MORRISON; C. C. MURDOCK; H. F. NEWHALL; L. G. PARRATT; J. S. SABY; (H. S. SACK, Engineering Physics); R. L. SPROULL; D. H. TOMBOULIAN; (W. B. WHALLEY, Engineering Physics); W. M. WOODWARD, and R. R. WILSON.

For a major in Physics, the following courses must be completed: (1) in Physics, twenty-four hours of courses numbered above 116 (excluding course 200), which shall include at least three hours of Physics 210 or its equivalent and nine hours selected from classroom credit in Physics 215-254; (2) in related subjects, Mathematics 201, and twelve hours in one of the following groups: (a) Chemistry, (b) Astronomy, (c) Biological science (6 hours of this must not be an introductory course), (d) Philosophy (History 911 and 912 may be substituted for 6 hours of Philosophy).

103. *INTRODUCTORY PHYSICS*. Fall term. Credit three hours. Demonstration lectures, M F 9 or 12. One laboratory period as arranged. Mr. HOWE and assistants. Mechanics, sound, and heat.

104. *INTRODUCTORY PHYSICS*. Spring term. Credit three hours. A continuation of Physics 103. Prerequisite, Physics 103, or entrance Physics. Hours and staff as in Physics 103.

Electricity and light.

107. *INTRODUCTORY PHYSICS*. Fall term. Credit four hours. Demonstration lecture, W 9. Recitations, T Th S and one laboratory period a week, as arranged. Prerequisite, Calculus or concurrent registration in Mathematics 171. Mr. GREISEN, Mr. LEVINGER, and assistants.

Mechanics, sound, and heat. Primarily for students majoring in science.

108. *INTRODUCTORY PHYSICS*. Spring term. Credit four hours. A continuation of Physics 107. Prerequisite, Physics 107, or 103 and consent of the instructor. Hours and staff as in Physics 107.

Electricity and light.

Note: Physics 115, 116, 117, and 118 form a sequence in a two-year continuous

course in *General Physics* required of all students of engineering who are candidates for the degrees of B. Chem. E., B.C.E., B.E.E., B.Eng.Phys., and B.M.E. Demonstrations, theory, experiments, and problem drill. One lecture, two recitations, and one laboratory period a week, as assigned. (Consult instructor in charge for available recitation and laboratory periods other than the ones described below).

115. MECHANICS. Fall term. Credit three hours. Prerequisite, Calculus or simultaneous registration in Mathematics 161. Entrance physics is desirable but not required. Lecture, Th 9 or 11. Recitations, M F 9. Laboratory, M 2-4:30. Mr. GRANTHAM, Mr. NEWHALL, and assistants.

Kinetics, statics, elasticity, liquids, and mechanics of gases.

The laboratory work consists of measurements of length, acceleration, velocity, elasticity, harmonic motion, moment of inertia, mass, centripetal force, and density.

116. WAVE MOTION, SOUND, AND HEAT. Spring term. Credit three hours. Prerequisites, Physics 115, Calculus or simultaneous registration in Mathematics 162. Lecture Th 9 or 11. Recitations, M F 9. Laboratory, M 2-4:30. Mr. GRANTHAM, Mr. NEWHALL, and assistants.

Wave motion, sound, acoustic measurements, temperature, calorimetry, changes of state, liquefaction of gases, heat transfer, and elementary thermodynamics.

The laboratory work consists of measurements of temperature, properties of gases, calorimetry, mechanical equivalent of heat, change of state, sound production, wave motion, speed of sound, and resonant phenomena.

117. ELECTRICITY AND MAGNETISM. Fall term. Credit three hours. Prerequisites, Physics 115, 116, Calculus or simultaneous registration in Mathematics 163. Lecture, T 8 or 11. Recitations, T Th 10. Laboratory, M 2-4:30. Mr. TOMBOULIAN, Mr. NEWHALL, and assistants.

Introductory study of the fundamental laws of electric and magnetic fields and their applications to elementary circuit problems. Electrostatic fields and potential; steady currents, induced emfs, inductance, dielectrics, capacitance, magnetic properties of matter, simple transients, alternating currents.

The laboratory work consists of basic measurements in direct current circuits.

118. PHYSICAL ELECTRONICS AND OPTICS. Spring term. Credit three hours. Prerequisite, Physics 117. Lecture, T 8 or 11. Recitations, T Th 10. Laboratory, M 2-4:30. Mr. TOMBOULIAN, Mr. NEWHALL, and assistants.

Selected topics in thermionics, photoelectricity, gaseous conduction, motion of ions in electric and magnetic fields, introductory geometrical optics, physical optics, including interference, diffraction and polarization, radiation, and simple spectra.

The laboratory work consists of measurements in electronics such as the determination of work function, characteristics of photo cells, cut off curves of magnetrons, simple lenses, dispersion, diffraction, resolving power, polarized light, and photometry.

200. PHYSICS FOR STUDENTS OF BIOLOGY AND MEDICINE. Either term. Credit three hours. Prerequisite, six semester hours of college work in each of the following: Physics, Chemistry, and biological science. Students having grades below 70 in Physics 103 and 104 are not encouraged to elect this course. Lectures, T Th 12. Laboratory, T or Th 2-4. Mr. BARNES.

Lectures, demonstrations, and laboratory experiments dealing with such topics in molecular physics, electricity and magnetism, electromagnetic radiation and nuclear physics as are related to the study of biology and medicine.

203 or 205. *ADVANCED GENERAL PHYSICS*. Fall term. Course 203, credit three hours. Course 205, credit five hours. Prerequisites, Physics 107 and 108, or consent of instructor, and Mathematics 172 (or in parallel). Lectures, M W F 9. Laboratory, included in Course 205, M W 1:40-4:30. Mr. McDANIEL.

Mechanics, probability, wave motion, and sound.

204 or 206. *ADVANCED GENERAL PHYSICS*. Spring term. Course 204, credit three hours. Course 206, credit five hours. Prerequisites, Physics 203 or 205, and Mathematics 173 (or in parallel). Lectures, M W F 9. Laboratory, included in Course 206, M W 1:40-4:30. Mr. CORSON.

Electricity, magnetism, optics, and atomic physics.

208. *PHYSICAL MECHANICS AND PROPERTIES OF MATTER*. Spring term. Credit three hours. Prerequisites, Physics 115 and Mathematics 161 and 162. Primarily for candidates for the degree of Bachelor of Engineering Physics. M W F 9. Mr. SACK.

Elements of kinematics; Newton's law, conservation laws; D'Alembert's principle; application to selected problems; hydrostatics; elementary fluid dynamics; elasticity; viscosity; surface tension.

210. *ADVANCED LABORATORY*. Either term. Credit three hours a term. Prerequisites, Physics 205 and 206, or the equivalents. Laboratory, T W or Th F 1:40-4:30. One discussion period to be arranged. Messrs. PARRATT, BAKER, CORSON, CUYKENDALL, DE WIRE, HARTMAN, McDANIEL, and WOODWARD.

Experimental work in a wide variety of fields is offered to meet the needs of the individual student. Considerable time may be spent on a relatively few topics, or many experiments may be performed to gain acquaintance in several fields. The laboratory work is individual, and stress is laid on independent work on the part of the student. Among the topics for which facilities are available are mechanics, acoustics, optics, spectroscopy, electrical circuits, electronics and ionics, heat and temperature measurements, x-rays, cosmic rays and nuclear physics.

215. *PHYSICAL OPTICS*. Fall term. Credit three or five hours. Prerequisites, Physics 206, or equivalent, and Calculus. Lectures, M W F 9. Laboratory, Th F 1:40-4:30, also T W 1:40-4:30 if a second section is warranted. Mr. HARTMAN.

Huygens and Fermat's principles, Fresnel and Fraunhofer diffraction, polarization of light, double refraction, optical activity, electromagnetic character of light, velocity of light, dispersion and reflection.

225. *ELECTRICITY AND MAGNETISM*. Fall term. Credit three hours. Prerequisite, Physics 117 or 206. Lectures, T Th S 9, and one optional problem period to be arranged. Mr. MURDOCK.

Electrostatic and electromagnetic fields, polarization of dielectrics and magnetic media, displacement current, plane electromagnetic waves, the Poynting vector.

236. *ELECTRICITY AND MAGNETISM*. Spring term. Credit three or five hours. Prerequisites, Physics 225 and Differential Equations. Lectures, T Th S 9. Laboratory, T W 1:40-4:30, also Th F 1:40-4:30 if a second section is warranted. Mr. TOMBOULIAN.

The formulation of circuit theory from the standpoint of the electromagnetic field. Validity and limitations of circuit concepts. Steady current circuits and networks, transients, alternating current circuits and networks, frequency characteristics of networks, circuits with distributed parameters, non-linear elements.

242. *ANALYTICAL MECHANICS*. Spring term. Credit three hours. Prerequisites, Physics 205 or 208, and Mathematics 201, or their equivalents. M W F 9. Mr. SPROULL.

Analytical mechanics of material particles, systems of particles, and rigid bodies; oscillations and forced vibrations; planetary motion; stability of orbits; Euler's equations; gyroscopic motion; Lagrange's equations.

243. *ATOMIC AND MOLECULAR PHYSICS*. Fall term. Credit three hours. Prerequisite, Physics 225. T Th S 9. Instructor to be announced.

The fundamental particles; statistical physics; the concepts of quantum mechanics; atomic structure and spectra; the periodic table; molecular structure and the chemical bond; fundamentals of nuclear physics.

[253. *WAVE MOTION AND SOUND*. Fall term. Credit three hours. Not offered in 1948-1949.]

254. *ELECTRONIC PROPERTIES OF SOLIDS AND LIQUIDS*. Spring term. Credit three or five hours. Prerequisite, Physics 243. Lectures, T Th S 9. Laboratory, Th F 1:40-4:30, also T W 1:40-4:30 if a second section is warranted. Mr. SACK.

Lattice structure of solids; magnetic, dielectric, and thermal properties of solids; electrical and optical properties of metals, semi-conductors, and ionic crystals; electron emission and barrier layer effects; relaxation phenomena in liquids and solids.

020. *INFORMAL STUDY IN PHYSICS*. Either term. Credit one to three hours a term. Reading or laboratory work in any branch of physics under the direction of a member of the staff. Hours to be arranged.

Note: For further information concerning the following courses see the Announcement of the Graduate School.

380. *ADVANCED LABORATORY*. Either term. Credit three hours a term. Prerequisite, Physics 210, or the equivalent, and consent of the instructor. Laboratory periods to be arranged. Messrs. PARRATT, BAKER, CORSON, CUYKENDALL, DE WIRE, HARTMAN, McDANIEL, and WOODWARD.

[382. *HIGH TEMPERATURE MEASUREMENTS*. Spring term. Credit two hours. Not offered in 1948-1949.]

383. *X-RAY EXPERIMENTS*. Fall term. Credit two or three hours. Prerequisite, consent of instructor. Two laboratory periods and one seminar. Mr. PARRATT.

[387. *SPECTROSCOPY*. Credit two hours. Not offered in 1948-1949.]

388. *X-RAY DIFFRACTION BY CRYSTALS*. Spring term. Credit two hours. Prerequisites, Physics 210 or the equivalent and Physics 582 or the consent of the instructor. Mr. MURDOCK.

391. *ELECTRONICS AND IONICS*. Fall term. Credit three hours. Prerequisite, one term of Physics 380. Two laboratory periods and one seminar. Mr. SPROULL.

393. *NUCLEAR PHYSICS LABORATORY*. Fall term. Credit two hours. Prerequisite, consent of instructor. Mr. DE WIRE.

396. *COSMIC RAY EXPERIMENTS*. Spring term. Credit two hours. Prerequisite, consent of instructor. Mr. GREISEN.

475. *THEORETICAL MECHANICS*. Fall term. Credit three hours. Prerequisite, Physics 242 or its equivalent. Mr. FEYNMAN.

476. *ELECTRODYNAMICS*. Spring term. Credit three hours. Prerequisite, Physics 225 or its equivalent. Mr. MORRISON.

477. *STATISTICAL MECHANICS AND KINETIC THEORY*. Fall term. Credit two hours. Prerequisites, Physics 475, and (or in parallel) Physics 485. Mr. MORRISON.

480. *THEORETICAL PHYSICS—READING COURSE*. Fall term. Repeated in the Spring term. Credit two hours. Mr. COURANT.

485. *INTRODUCTORY QUANTUM MECHANICS*. Fall term. Credit three hours. Prerequisites, Physics 475 and 476. Mr. MORRISON.

486. *APPLICATIONS OF QUANTUM MECHANICS*. Spring term. Credit three hours. Prerequisite, Physics 485. Mr. BETHE.

[491. *ADVANCED QUANTUM MECHANICS*. Fall term. Credit three hours. Not offered in 1948–1949.]

[582. *X-RAY CRYSTALLOGRAPHY*. Spring term. Credit three hours. Not offered in 1948–1949.]

[588. *X-RAYS*. Spring term. Credit three hours. Not offered in 1948–1949.]

[681. *ADVANCED ELECTRON PHYSICS*. Fall term. Credit three hours. Not offered in 1948–1949.]

683. *THE THEORY AND PROPERTIES OF SOLIDS*. Fall term. Credit three hours. Prerequisite, Physics 485 or its equivalent. Mr. SMITH.

[692. *ADVANCED ELECTRONICS LABORATORY*. Spring term. Credit three hours. Not offered in 1948–1949.]

781. *NUCLEAR PHYSICS*. Fall term. Credit two hours. Prerequisites, Physics 243 and (or in parallel) Physics 485 and the consent of the instructor. Mr. WILSON.

[782. *THEORY OF NUCLEI*. Spring term. Credit two hours. Not offered in 1948–1949.]

784. *COSMIC RAYS*. Spring term. Credit three hours. Prerequisite, a course in introductory Theoretical Physics. Mr. GREISEN.

786. *THEORY OF HIGH ENERGY PHENOMENA*. Spring term. Credit two hours. Prerequisite, Physics 486, or the equivalent. Mr. FEYNMAN.

080. *INFORMAL STUDY IN PHYSICS*. Either term. Credit one to three hours a term. Special reading or problem work done under the direction of a member of the staff. Hours to be arranged.

090. *SPECIAL LABORATORY WORK*. Either term. Credit one to three hours a term. Laboratory work in any branch of physics under the direction of a member of the staff. Hours to be arranged.

PSYCHOLOGY

Mr. K. M. DALLENBACH, *Acting Chairman*; Messrs. M. E. BITTERMAN, R. DALTON, F. S. FREEMAN, G. L. KREEZER, H. S. LIDDELL, F. L. MARCUSE, F. B. PRICE, Mrs. MARY S. RYAN, Messrs. T. A. RYAN, A. L. WINSOR.

For a major in Psychology, the following courses must be completed: (1) in Psychology, twenty-four hours, including Psychology 101, 102, and 204; at least six

hours of the twenty-four should be chosen from Psychology 207, 208, 211, and 404; (2) in related subjects, fifteen additional hours including Statistics 101 and Physiology 303 or Human Growth and Development 201. The remaining hours are to be chosen in consultation with the adviser from courses in Biology, Chemistry, Education, Mathematics, Physics, Philosophy, Sociology and Anthropology, and Zoology.

Students intending to pursue advanced work in Psychology, or desiring information concerning particular sequences of courses in the subject leading to vocational careers, should consult a special bulletin issued by the Department. This bulletin assembles all the courses in Psychology and its ramifications, offered by the various schools and colleges of the University.

101. *ELEMENTARY PSYCHOLOGY*. Either term. Credit three hours. Open to freshmen. Fall term: Lectures, M W 9 or 11; Recitation, Th 8, 9, 10, 11, 12; F 8, 9, 10, 11, or S 8, 9, 10. Spring term: Lectures, Th S 11; Recitation, M 8, 9, 10; T 8, 11, 12; or W 8, 9. Mr. KREEZER and assistants.

102. *ELEMENTARY PSYCHOLOGY*. Either term. Credit three hours. Prerequisite, Psychology 101. Spring term: Lectures, M W 9 or 11; Recitation, Th 8, 9, 10, 11, 12; F 8, 9, 10, 11; or S 8, 9, 10. Fall term: Lectures, Th S 11; Recitation, M 9, 10, 11, 12; or T 8, 11, 12. Mr. MARCUSE and assistants.

Psychology 101 and 102 are prerequisites to all later courses in Psychology. They deal with the basic problems and principles of human psychology, and are designed as a general foundation for the study of experimental, social, animal, and child psychology, for psychotechnology and for the psychology of the abnormal. Class demonstrations will supplement the lectures and recitations.

[203. *GENERAL PSYCHOLOGY*. Either term. Credit three hours. Lectures, T Th 10. Recitation, F 8, 9, or 12; S 9, 10, or 11. Mr. MARCUSE and assistants.

A survey of the fields of animal, social, educational, child, and applied and abnormal psychology. Not offered in 1948-1949.]

204. *LABORATORY IN EXPERIMENTAL PSYCHOLOGY*. Either term. Credit three hours. Prerequisites, Psychology 101 and 102. T Th S 9-11; M W F 2-4. Mrs. RYAN and assistants.

This course is required for all further laboratory work in Psychology. It provides elementary training in the methods of experimentation. A representative series of experiments drawn from the field of psychology will be performed by every student.

[205. *INTERMEDIATE COURSE IN PSYCHOLOGY*. Fall term. Credit three hours. Prerequisites, Psychology 101 and 102, and consent of the instructor. Not offered in 1948-1949.]

207. *PERCEPTION*. Fall term. Credit three hours. Prerequisites, Psychology 101 and 102, and consent of the instructor. M W F 12. Mr. BITTERMAN.

The place of perception in psychology and its relation to everyday living. A review of the important experiments, with special emphasis upon recent developments and upon modern theories of perception.

208. *MEMORY AND THINKING*. Spring term. Credit three hours. Prerequisites, Psychology 101, 102, 204, and consent of the instructor. M W F 11. Mr. BITTERMAN.

A survey of the experimental literature dealing with the fundamental processes and conditions of human learning and thinking.

[210. *COMPARATIVE PSYCHOLOGY*. Fall term. Credit three hours. Prerequisites, Psychology 101 and 102. M W F 2. Mr. KREEZER. Not offered in 1948-1949.]

211. *PHYSIOLOGICAL PSYCHOLOGY OF THE SENSES*. Fall term. Credit three hours. Prerequisites, Psychology 101 and 102. M W F 3. Mr. DALLENBACH.

Lectures and demonstrations on the experimental psychology of the special senses together with a study of the nervous structures involved.

213. *LEGAL PSYCHOLOGY*. Spring term. Credit three hours. Prerequisites, Psychology 101 and 102 or consent of the instructor. M W F 12. Mr. PRICE.

Intended for pre-law students only. Applications of general psychological principles to problems of testimony, lie detection, and a consideration of abnormal behavior as applied to law.

275. *HISTORY OF EXPERIMENTAL PSYCHOLOGY*. Spring term. Credit three hours. Prerequisite, senior standing and consent of the instructor. M W F 10. Mr. DALLENBACH.

301. *CONTEMPORARY PSYCHOLOGY*. Spring term. Credit three hours. Prerequisite, upperclass standing and consent of the instructor. M W F 9. Mr. BITTERMAN.

A comparative study of current psychological theory; existential psychology, behaviorism, Gestalt psychology, and psychoanalysis.

303. *THE NORMAL AND THE ABNORMAL*. Fall term. Credit three hours. Prerequisite, Psychology 101 and 102, or consent of the instructor. Lectures, T Th 8; Recitations, M W F S 8. Mr. LIDDELL.

An introduction to the psychological defects and disorders.

375. *ANALYSIS AND INTERPRETATION OF QUANTITATIVE DATA IN PSYCHOLOGY*. Spring term. Credit three hours. Prerequisites, Psychology 204 and a first course in Statistics. Open only to seniors majoring in Psychology and to graduate students. T Th 3-4:15. Mr. RYAN.

An analysis of the methods for treating various kinds of psychological data. Tests of significance, correlational analysis and analysis of variance, in their application to psychological research.

401. *PSYCHOSOMATIC PROBLEMS*. Fall term. Credit three hours. Prerequisite, consent of the instructor. M W F 10. Mr. MARCUSE.

This course deals with certain aspects of clinical psychology with special reference to the role of the clinical psychologist in studying the etiology and therapy of physiological disorders.

403. *MINOR RESEARCH PROBLEMS*. Either term. Credit three hours. Prerequisites, Psychology 101 and 102, 204, and special courses required by the instructor. Hours to be arranged. Messrs. BITTERMAN, DALLENBACH, LIDDELL, FREEMAN, KREEZER, MARCUSE, PRICE, M. S. RYAN, and T. A. RYAN.

Research in informal study in general, abnormal, animal, applied, physiological, and social psychology. The course is designed for students majoring in Psychology who are prepared to undertake original investigations.

404. *PSYCHOBIOLOGY*. Spring term. Credit three hours. Prerequisite, junior standing. M W F 11. Mr. KREEZER.

The principal biological mechanisms of behavior with special reference to man.

440. *PSYCHOLOGY FOR ENGINEERING STUDENTS*. Either term. Credit three hours. Open by permission to students in Arts and Sciences. Lectures, Th S 8; Recitations, M 8, 9, 10, 11, or T 8, 9, 10, 11. Mr. PRICE and assistants.

A survey of some of the basic concepts of psychology including such topics as motivation, emotion, learning, intelligence, personality, and individual differences.

441. *PSYCHOLOGY FOR STUDENTS IN THE SCHOOL OF INDUSTRIAL AND LABOR RELATIONS*. Fall term. Credit three hours. Lectures, T Th 11; Recitations, Th 2, 3 or F 12, 2. Mr. PRICE and assistants.

A general survey course including such topics as motivation, learning, intelligence, personality, and individual differences.

450. *INDUSTRIAL PSYCHOLOGY*. Fall term. Credit three hours. Prerequisites, Psychology 101, 102, Statistics 101, or consent of the instructor. T Th S 9. Mr. RYAN.

A study of experimental and statistical analyses of psychological problems in industrial selection and training, fatigue, and efficiency, advertising, selling, and market research.

451. *WORK, FATIGUE, AND EFFICIENCY*. Spring term. Credit three hours. Prerequisites, Psychology 101 and 102, or 440, or 441, or consent of instructor. T Th S 9. Mr. RYAN.

A survey of the external and internal factors which affect the efficiency, speed, and accuracy of human work. Consideration will be given to sedentary or "mental" work as well as to physical work, in relation to fatigue, monotony, rest, sleep, and the effects of noise, light, temperature, narcotics, incentives, and social factors.

452. *ADVANCED INDUSTRIAL PSYCHOLOGY*. Fall term. Credit three hours. Prerequisites, Psychology 450 and 451 and consent of instructor. M W 9 and laboratory hours to be arranged. Mr. BITTERMAN.

An introduction to research techniques in industrial psychology. Test construction, including analysis of reliability and validity, fatigue studies, morale surveys, job analysis, evaluating of training programs, advertising and market research. Laboratory exercises in the use of these techniques.

475. *TECHNIQUE OF EXPERIMENTATION*. Spring term. Credit three hours. For seniors and graduate students. Prerequisite, consent of the instructor. M W F 4. Experimental hours to be arranged. Mr. DALLENBACH.

A study of the principles and processes of psychological research.

502. *THE PSYCHOPHYSICAL METHODS*. Spring term. Credit three hours. Prerequisites, Psychology 204 and Statistics 101. M W F 2. Mr. DALLENBACH.

510. *THEORY OF RESPONSE-SYSTEMS*. Fall term. Credit three hours. Primarily for graduate students. Prerequisite, consent of instructor. M W F 2. Mr. KREEZER.

This course will examine the possibilities of a general theory of response-systems. It will review the theory of linear physical systems and the procedures necessary for extending its concepts to psychological and biological systems.

575. *SEMINAR IN PSYCHOLOGY*. Fall term. Repeated in the spring term. Credit three hours. Primarily for graduate students. M 7:30-9:30 P. M. Mr. DALLENBACH.

576. *ADVANCED ABNORMAL PSYCHOLOGY*. Spring term. Credit three hours.

Primarily for graduate students. Prerequisite, consent of the instructor. F 7-9:30 P.M. Mr. MARCUSE.

Intensive study of selected topics.

580. *CONDITIONING AND EXPERIMENTAL NEUROSES*. Fall term. Credit three hours. Prerequisite, consent of the instructor. Seminar, M 2-4:30 and an afternoon hour to be arranged. Mr. LIDDELL.

Seminar and demonstrations of phenomena of conditioned reflex action and neurotic patterns in animals.

601. *EDUCATIONAL PSYCHOLOGY*. Fall term. Credit three hours. Prerequisite, Human Growth and Development. Other qualified students may be admitted on consent of the instructor. M W F 11. Mr. FREEMAN.

The major facts and principles of psychology bearing on educational practice and theory.

607. *MENTAL MEASUREMENTS*. Fall term. Credit three hours. Not open to sophomores. Prerequisite, a course in psychology and a course in statistics, or consent of the instructor. T Th S 9. Mr. FREEMAN.

Development of individual and group psychological tests; principles underlying their construction and use; their use in schools, psychological clinics, and in other fields. Psychological theories of the nature of mental abilities. Demonstrations and administering and interpreting tests.

618. *INDIVIDUAL DIFFERENCES*. Spring term. Credit three hours. Not open to sophomores. Prerequisite Psychology 607 or its equivalent, or consent of the instructor. T Th 2-3:15. Mr. FREEMAN.

The nature, causes, and implications of individual differences in human abilities and behavior. Study of atypical groups.

675. *SEMINAR IN HUMAN DEVELOPMENT AND BEHAVIOR*. Spring term. Credit two hours. Primarily for graduate students. Seniors may be admitted with the consent of the instructor. M 4-6. Mr. FREEMAN.

Recent experimental and clinical materials and theories, and their practical implications.

680. *PROCEDURES IN CLINICAL CHILD GUIDANCE*. Fall term. Credit three hours. Prerequisite, Psychology 607, or its equivalent. Primarily for graduate students; a limited number of seniors will be admitted. All students must have consent of the instructor. M 4-6, and conferences to be arranged. Mr. FREEMAN.

ROMANCE LITERATURE

Mr. MORRIS BISHOP, *Chairman*; Messrs. T. G. BERGIN, G. I. DALE, B. L. RIDEOUT.

For a major in French Literature, Italian Literature, or Spanish Literature, the following courses must be completed: (1) eighteen hours of courses in the literature of the major; (2) twelve hours of courses in a second literature (except that English 111-112 may not be counted); (3) in related subjects, eighteen hours to be selected from the Division of Literature, the Division of Modern Languages, Classics, History

of Art, European History, History of Music, and History of Philosophy; except that the twelve hours of courses specified under (2) above may not be counted as a related subject.

FRENCH LITERATURE

301-302. *SURVEY OF FRENCH LITERATURE*. Throughout the year. Credit three hours a term. Prerequisite, French 201 in the Division of Modern Languages, or four years of entrance French, or consent of the instructor. M W F 11. Mr. BISHOP.

Lectures in French and classroom discussions on French literature from the medieval period to the present day.

311-312. *LITERATURE OF THE SIXTEENTH CENTURY*. Throughout the year. Credit two hours a term. Prerequisite, French 301. T Th 12. Mr. BISHOP.

Lectures in French and classroom discussions, with special emphasis on the ideas and literary principles of the Renaissance.

[313-314. *LITERATURE OF THE SEVENTEENTH CENTURY*. Not offered in 1948-1949.]

[315-316. *LITERATURE OF THE EIGHTEENTH CENTURY*. Not offered in 1948-1949.]

[317-318. *LITERATURE OF THE EARLY NINETEENTH CENTURY*. Not offered in 1948-1949.]

[319-320. *LITERATURE OF THE LATE NINETEENTH CENTURY*. Not offered in 1948-1949.]

321-322. *LITERATURE OF THE TWENTIETH CENTURY*. Throughout the year. Credit three hours a term. Prerequisite, French 302. M W F 9. Mr. BISHOP.

Lectures in French and classroom discussion. The dominant ideas of the twentieth century and their expression in literature; the precursors, the literature of two wars and the *entre-deux-guerres*; the tendencies of our own time.

361-362. *FRENCH CULTURE AND CIVILIZATION*. Throughout the year. Credit two hours a term. Prerequisite, proficiency in French, or the consent of the instructor. T Th 2. Mr. RIDEOUT.

Lectures in French and classroom exercises. A rapid survey of French political, social, economic, and religious history, of the development of French law, education, science, architecture, art, and music.

375-376. *MODERN FRENCH SEMINAR*. Throughout the year. Credit two hours a term. Mr. BISHOP.

An introduction to the methods and materials of research in French literature, by means of a collective study of a problem of literary history.

ITALIAN LITERATURE

401-402. *DANTE*. Throughout the year. Credit three hours a term. Hours to be arranged. Mr. BERGIN.

Reading of the *Divina Commedia*, with a study of the background of the poem and its significance.

407-408. *SURVEY OF ITALIAN LITERATURE*. Throughout the year. Credit three hours a term. Prerequisite, Italian 401-402 or consent of the instructor. Hours to be arranged. Mr. BERGIN.

A study of the characteristic works of Italian writers from Petrarch to D'Annunzio, with particular attention to the leading figures of the Renaissance.

411-412. *ITALIAN LITERATURE SINCE THE RENAISSANCE*. Throughout the year. Credit three hours a term. Prerequisite, Italian 401-402 or consent of the instructor. Hours to be arranged. Mr. BERGIN.

A study of the various genres of more recent Italian literature, the poets from Parini to Pascoli, the drama from Goldoni to Pirandello, the nineteenth century novelists.

475-476. *SEMINAR IN ITALIAN LITERATURE*. Throughout the year. Credit two hours a term. Hours to be arranged. Mr. BERGIN.

Critical examination of a problem in Italian literary history.

SPANISH LITERATURE

[501-502. *SURVEY OF SPANISH LITERATURE*. Not offered in 1948-1949.]

503-504. *SURVEY OF SPANISH-AMERICAN LITERATURE*. Throughout the year. Credit three hours a term. Prerequisite, Spanish 201, or consent of the instructor. M W F 11. Mr. DALE.

Lectures in Spanish and classroom discussions on literary developments in Spanish America, with reading of the most important works.

511-512. *CERVANTES*. Throughout the year. Credit three hours a term. T Th S 11. Mr. DALE.

Reading of all the significant work of Cervantes, with critical, interpretative, and historical study.

521. *THE CONTEMPORARY SPANISH-AMERICAN NOVEL*. Fall term. Credit three hours. T Th S 10. Mr. DALE.

Extensive reading, with critical study of the major works.

522. *THE MODERNIST MOVEMENT IN SPANISH-AMERICAN LITERATURE*. Spring term. Credit three hours. T Th S 10. Mr. DALE.

The poetry of Spanish America from 1880 to 1910 will be studied critically and its significance estimated.

[575-576. *OLD SPANISH*. Not offered in 1948-1949.]

[581-582. *CALDERON AND ALARCON*. Not offered in 1948-1949.]

585-586. *THE PICARESQUE NOVEL*. Throughout the year. Credit two hours a term. M 2-4. Mr. DALE.

RUSSIAN LITERATURE

Mr. VLADIMIR NABOKOV.

For a major in Russian Literature, the instructor should be consulted.

301-302. *SURVEY OF RUSSIAN LITERATURE*. Throughout the year. Credit three hours a term. Prerequisite, proficiency in Russian. M W F 12. Mr. NABOKOV.

Lectures in Russian and classroom exercises on the development of Russian literature, with particular emphasis on the nineteenth century.

311-312. *RENAISSANCE OF RUSSIAN POETRY*. Throughout the year. Credit three hours a term. Prerequisite, proficiency in Russian. Hours to be arranged. Mr. NABOKOV.

A study of Russian poetry from 1890 to 1925, of neo-romanticism and neo-classicism, from Blok to Pasternak and Khodassevich. The course is conducted in Russian.

SOCIOLOGY AND ANTHROPOLOGY

Mr. L. S. COTTRELL, JR., *Chairman*; Mr. M. L. BARNETT, Miss L. CALHOUN, Messrs. J. A. CLAUSEN, LOUIS GUTTMAN, A. H. LEIGHTON, P. J. MCCARTHY, R. L. SHARP, E. A. SUCHMAN, F. C. WHITE, R. M. WILLIAMS, JR.

For a major in Sociology and Anthropology, the following courses must be completed: (1) twenty-four hours in Sociology and Anthropology in addition to Sociology and Anthropology 101, or its equivalent; (2) twenty-one hours in related subjects to be chosen with the approval of the adviser. All students majoring in this department must satisfactorily complete Statistics 101 and Sociology and Anthropology 201 and 202.

Students intending to pursue advanced work in Sociology or Anthropology, or desiring information concerning particular sequences of courses leading to graduate study or to careers within these fields should consult a special bulletin to be issued by the Department.

101. *INTRODUCTION TO THE STUDY OF SOCIETY*. Either term. Credit three hours. Open to all students although primarily intended for freshmen. Not open to those who have credit for Social Science 1 or Rural Sociology 1. M W F 8, 10, 12, or 2; T Th S 8, 10, 12. Messrs. CLAUSEN, BARNETT, Miss CALHOUN, Messrs. FOOTE, and WHITE.

An introduction to the study of societies as interrelated systems; selected major problems of contemporary American society as seen in the context of our own social system; social factors in personality formation.

102. *MAN AND CULTURE*. Spring term. Credit three hours. Open to freshmen. M W F 9. Mr. SHARP.

A broad survey of the fields of physical and cultural anthropology. Topics include: human origins and evolution; early and modern types of man; prehistoric archaeology and the development of cultures in the Old and New World; cultural changes associated with the great technological revolutions.

103. *CONTEMPORARY SOCIAL PROBLEMS*. Spring term. Credit three hours. Prerequisite, Sociology and Anthropology 101, or equivalent. Open to freshmen. T Th S 11. Mr. CLAUSEN.

Major social problems of modern urban society viewed in terms of the factors underlying social disorganization and individual maladjustment.

201. *INTRODUCTION TO RESEARCH METHODS*. Fall term. Credit three hours. Prerequisite, Sociology and Anthropology 101, or equivalent. Not open to freshmen. M W F 10. Mr. CLAUSEN.

Problems of research design and techniques for gathering data in sociological research.

202. *ANALYSIS AND INTERPRETATION OF SOCIOLOGICAL DATA*. Spring

term. Credit three hours. Prerequisite, Statistics 101 or the equivalent. Not open to freshmen. M W F 10. Mr. SUCHMAN.

The application of simple statistical techniques to the analysis of quantitative data. Interpretation of evidence and consideration of sources of error and of bias.

210. *THE FAMILY*. Spring term. Credit three hours. Prerequisite, Sociology and Anthropology 101, or the equivalent. Not open to freshmen. T Th S 12. Mr. COTTRELL.

The development of the family as a social institution in modern society; the relation between cultural changes and changes in the family; the social psychology of intra-family relationships.

[223. *DELINQUENCY AND CRIME*. Fall term. Credit three hours. Given in alternate years. Not offered in 1948-1949.]

228. *PROBLEMS IN MINORITY GROUP RELATIONS*. Spring term. Credit three hours. Prerequisite, Sociology and Anthropology 101 or the equivalent. Not open to freshmen. M W F 10. Mr. BARNETT.

A study of the distribution of minority groups in the United States and the social interaction of racial and ethnic groups in this country. Selected groups will be given special attention.

301. *SOCIAL PSYCHOLOGY: INTER-PERSONAL BEHAVIOR*. Fall term. Credit three hours. Prerequisite, Sociology and Anthropology 101 and one course in Psychology or the equivalent. Not open to freshmen. M W F 11. Mr. COTTRELL.

Social psychological analysis of the processes and products of personal interaction.

302. *SOCIAL PSYCHOLOGY: GROUP DYNAMICS*. Spring term. Credit three hours. Prerequisite, Sociology and Anthropology 101 and one course in Psychology or the equivalent. Not open to freshmen. M W F 11. Mr. COTTRELL.

Social psychological analysis of the processes and products of intra- and inter-group behavior.

311. *PUBLIC OPINION*. Fall term. Credit three hours. No prerequisites. Not open to freshmen. M W F 9. Mr. SUCHMAN.

The nature and control of public opinion, including opinion formation and change. A study of the methods and techniques of public opinion and attitude analysis.

[312. *MASS COMMUNICATION MEDIA*. Spring term. Credit three hours. Given in alternate years. T Th S 11. Mr. SUCHMAN. Not offered in 1948-1949.]

A study of the media of mass communication in modern society. Special attention is given to the role of the radio, the press, and the motion pictures; their growth and distribution, content, audience, and effects. Course includes a study of the methods of communications research.

313. *COLLECTIVE BEHAVIOR AND SOCIAL MOVEMENTS*. Spring term. Credit three hours. Prerequisite, Sociology and Anthropology 101 or equivalent. Not open to freshmen. T Th S 10. Mr. CLAUSEN.

The conditions underlying the mechanisms and the consequences of collective behavior as manifested in crowds, mobs, mass movements, and similar phenomena.

HUMAN RELATIONS IN INDUSTRY. (See Industrial and Labor Relations 44.)

[410. *POPULATION PROBLEMS*. Spring term. Credit three hours. Given in alternate years. Not offered in 1948-1949.]

[414. *SOCIAL PLANNING*. Spring term. Credit three hours. Not offered in 1948-1949.]

431. *STRUCTURE AND FUNCTIONING OF AMERICAN SOCIETY—I*. Fall term. Credit three hours. Prerequisite, Sociology and Anthropology 101 or equivalent. Not open to freshmen. T Th S 9. Mr. WILLIAMS.

Institutional structure and social organization of the United States.

432. *STRUCTURE AND FUNCTIONING OF AMERICAN SOCIETY—II*. Spring term. Credit three hours. Prerequisite, Sociology and Anthropology 101 or equivalent. Not open to freshmen. T Th S 9. Mr. WILLIAMS.

Analysis of the functional interrelations of groups and institutions in American society.

433. *THE SOCIOLOGY OF ECONOMIC CLASSES*. Fall term. Credit three hours. Prerequisite, Sociology and Anthropology 101 or the equivalent and consent of the instructor. Not open to freshmen. T Th S 8. Mr. FOOTE.

A sociological analysis of the specific nature of American economic classes and their interrelations.

575. *THEORY OF CULTURE AND SOCIAL ORGANIZATION*. Fall term. Credit three hours. Open to seniors and graduate students with the consent of the instructor. T Th S 12. Mr. WILLIAMS.

Analysis of convergence in modern sociological thought. Includes consideration of sociological elements of major recent theories in related fields. The works of a number of the more important modern social scientists will be analyzed in developing a consistent theoretical framework.

SOCIOLOGICAL THEORY. (See Rural Sociology 207.)

SYSTEMATIC SOCIOLOGY. (See Rural Sociology 208.)

601. *CULTURAL ANTHROPOLOGY*. Fall term. Credit three hours. Open to juniors, seniors, and graduate students. M W F 12. Mr. OPLER.

Problems in the historical and comparative study of cultures, both primitive and complex; the component parts of culture and their interrelations; analysis of processes involved in the impact of cultures on each other and in changing cultural systems.

602. *CULTURE AND PERSONALITY*. Spring term. Credit three hours. Prerequisite, Sociology and Anthropology 301 or 601, or consent of instructors. M W F 12. Mr. OPLER and Mr. LEIGHTON.

A comparative study of personality formation in different cultures; overt and covert behavior of the individual, both normal and abnormal, as a function of cultural determinants; the problem of type or group personality structure.

[603. *NATIVE CULTURES OF SOUTHEAST ASIA AND THE PACIFIC*. Fall term. Credit three hours. Given in alternate years. Not offered in 1948-1949.]

[604. *THE MODERNIZATION OF SOUTHEAST ASIA AND THE PACIFIC*. Spring term. Credit three hours. Given in alternate years. Not offered in 1948-1949.]

STATISTICAL REASONING. (See Statistics 101 under Interdepartmental offerings in Statistics.)

SEMINARS AND INFORMAL STUDY

075. *INFORMAL STUDY*. Throughout the year. Credit and hours to be arranged. Open to upperclass majors and graduate students in Sociology and Anthropology. Members of the Department Staff.

[275-276. *SEMINAR IN RESEARCH METHODS IN SOCIOLOGY AND ANTHROPOLOGY*. Throughout the year. Credit two hours a term. Not offered in 1948-1949.]

375. *SEMINAR IN SOCIAL PSYCHOLOGY*. Spring term. Credit two hours. Prerequisite, Sociology and Anthropology 301 or 302. W 2-4. Mr. COTTRELL.

376. *SEMINAR ON PRESSURE GROUPS AND PROPAGANDA*. Fall term. Credit two hours. Prerequisite, consent of instructors. W 2-4. Mr. COTTRELL and Mr. SUCHMAN.

475. *SEMINAR IN GROUP RELATIONS*. Fall term. Credit two hours. Prerequisite, consent of the instructor. T 2-4. Mr. WILLIAMS.

[476. *SEMINAR: SOCIAL CHANGE AND SOCIAL PLANNING*. Spring term. Credit two hours. Not offered in 1948-1949.]

SEMINAR IN HUMAN RELATIONS IN INDUSTRY. (See Industrial and Labor Relations 104.)

[675. *SEMINAR IN ANTHROPOLOGY: PROBLEMS IN EAST ASIATIC ANTHROPOLOGY*. Fall term. Hours and credit to be arranged. Prerequisite, consent of the instructor. Mr. SHARP. Not offered in 1948-1949.]

676. *SEMINAR IN ANTHROPOLOGY: SPECIAL PROBLEMS IN CULTURAL ANTHROPOLOGY*. Spring term. Hours and credit to be arranged. Prerequisite, consent of the instructor. Mr. OPLER.

677. *SEMINAR: THE MODERNIZATION OF SELECTED FOREIGN CULTURES*. Throughout the year. Hours and credit to be arranged. Prerequisite, consent of instructor. Mr. OPLER and staff.

[775-776. *SEMINAR IN ADVANCED STATISTICAL METHODS*. Throughout the year. Credit two hours a term. Not offered in 1948-1949.]

SPEECH AND DRAMA

Mr. H. A. WICHELS, *Chairman*; Messrs. H. D. ALBRIGHT, C. C. ARNOLD, DONALD BLANDING, P. C. BOOMSLITER, R. R. CARSON, GIRAUD CHESTER, A. M. DRUMMOND, W. H. STANTON, C. K. THOMAS.

Students may elect a general major, or a major with emphasis on (1) Rhetoric and Public Speaking, (2) Phonetics and Speech training, (3) Dramatic Production. The following courses must be completed: (1) in the Department, twenty-one hours including nine hours from courses 101, 102, 111 (or 141), 333; (2) in related subjects, six hours of courses not taken in the freshman year in each of the following groups—(a) English; (b) Economics, History, Government, Sociology; (c) Philosophy. Of this total of thirty-nine hours, twenty-four must be in other than introductory courses.

Students planning to teach Speech should satisfy the basic requirements for teach-

ers of English. For those preparing to teach English, the Department recommends fifteen to eighteen hours in Speech and Drama including courses 101, 111 (or 141), 333, 401.

INTRODUCTORY COURSES

101. *PUBLIC SPEAKING*. Either term. Credit three hours. Not open to freshmen nor to students who have taken Speech 103 or 105. M W F 8, 9, 10, 11, 12, or 2; T Th S 8, 9, 10, or 11. Messrs. ARNOLD, BLANDING, CARSON, CHESTER, and assistants.

Practice in speaking, on subjects of current interest; methods of preparation and delivery; various types of speech experience, such as exposition, advocacy, reading aloud, discussion, and chairmanship; study of principles and of noted examples; conferences.

Foreign students and others whose pronunciation of English falls below the normal standard, and students with special vocal problems, are advised to confer with Mr. THOMAS before registering.

102. *PUBLIC SPEAKING*. Either term. Credit three hours. Prerequisite, Speech 101, 103, or 105. M W F 11. Mr. CHESTER.

Study of interest, persuasion, and psychology of the audience as problems of speech-making; experience in various forms of public address; conferences.

103. *PUBLIC SPEAKING*. For students in the School of Industrial and Labor Relations only.

105. *PUBLIC SPEAKING*. For students in Mechanical Engineering only.

111. *ORAL INTERPRETATION OF LITERATURE*. Fall term. Credit three hours. Not open to freshmen, nor to students who have taken Speech 141. M W F 12. Mr. CHESTER.

Study, for understanding and appreciation, of poetry and prose selected from the best English and American writers; practice in reading aloud; conferences; drill.

131. *VOICE TRAINING*. Either term. Credit two hours. Open to freshmen. Consult the instructor before registering. Fall term: T Th 2; Spring term: T Th 10 or 2. Mr. BOOMSLITER.

An elementary course for the improvement of the speaking voice. Individual and group practice in the overcoming of such faults as nasality, weak quality, and indistinctness. Attention to the principles of voice production. Students with special vocal problems are advised to take this course before 101.

133. *TRAINING FOR STUTTERERS*. Fall term. Credit two hours. Open to freshmen. M F 11. Mr. BOOMSLITER.

The nature of the problem; corrective exercises; conferences.

141. *DRAMATIC INTERPRETATION*. Spring term. Credit three hours. Not open to freshmen, nor to students who have taken Speech 111; prerequisite, consent of the instructor. M W F 10. Mr. ALBRIGHT.

Analysis and interpretative reading of various types of dramatic prose and poetry; principles of stage presentation; reports, individual exercises, and group rehearsal.

[175. *ART OF THE THEATRE*. Not offered in 1948-1949.]

PUBLIC SPEAKING: ORAL READING

205. *DISCUSSION*. Either term. Credit three hours. Open to sophomores and upperclassmen; not open to students who have taken Speech 103. M W F 10. Mr. ARNOLD.

Practice in discussion of current problems by use of the various forms: round-table, panel, symposium, dialogue, parliamentary, lecture-forum; study of the principles of systematic investigation, reflective thinking, group procedure, and leadership in discussion; conferences.

[209. *ORAL INTERPRETATION OF LITERATURE*. Not offered in 1948-1949.]

213. *ARGUMENT*. Either term. Credit three hours. Prerequisite, Public Speaking 101, or consent of the instructor. Fall term: M W F 12, Mr. WICHELS. Spring term: M W F 10, Mr. ———.

Practice in argumentative speaking and debating on current problems; study of the principles of reasoned discourse and of advocacy; conferences.

214. *ARGUMENT*. Spring term. Credit three hours. Prerequisite, Speech and Drama 213. M W F 12. Mr. WICHELS.

Advanced study of methods and types of argumentation; practice in cross-examination, and in forensic and parliamentary debate; study of noted arguments.

221. *FORMS OF PUBLIC ADDRESS*. Fall term. Credit three hours. Open by consent of the instructor to juniors and seniors who have had one course in public speaking. M W F 11. Mr. WICHELS.

A survey of the types of public address employed in modern democracies. Readings, selected chiefly from the works of Burke, Webster, Lincoln, Churchill, and Roosevelt; some practice in composition and delivery.

241. *PUBLIC OPINION AND THE METHOD OF ARGUMENT*. Spring term. Credit three hours. Not open to freshmen. M W F 11. Mr. WICHELS.

A critical study of the discussion of public affairs, oral and written, in various ages of democracy; the principal types, examples, and conditioning factors. Lectures, readings, and reports.

[275-276. *HISTORY OF PUBLIC ADDRESS*. Not offered in 1948-1949.]

281-282. *BRITISH ORATORS*. Throughout the year. Credit three hours a term. Open to upperclassmen by consent of the instructor. T 2-4:30. Mr. ARNOLD.

A study of leading British orators from the sixteenth century to the present. Lectures, readings, and reports.

[287-288. *THEORIES OF PUBLIC ADDRESS*. Not offered in 1948-1949.]

The Department calls attention to three prizes in Public Speaking, competition for which will be open in the spring term: The Woodford Prize, for seniors; the Class of 1894 Memorial Prize in Debate, for juniors and seniors; and the Class of 1886 Memorial Prize in Public Speaking, for sophomores and juniors.

SPEECH TRAINING AND PHONETICS

333. *ENGLISH PHONETICS*. Fall term. Credit three hours. Not open to freshmen. T Th S 11. Mr. THOMAS.

Principles of phonetics; study of English pronunciation, based chiefly on contemporary American usage; practice in phonetic analysis, and, where necessary, drill for the improvement of individual speech.

[334. *PRINCIPLES OF PHONETICS*. Not offered in 1948-1949.]

336. *REGIONAL AND HISTORICAL PHONETICS*. Spring term. Credit three hours. Prerequisite, Speech 333. T Th S 11. Mr. THOMAS.

The major varieties of American pronunciation and their development.

341-342. *STRUCTURE AND FUNCTIONING OF THE SPEECH MECHANISM*. Throughout the year. Credit three hours a term. M W F 12. Mr. BOOMSLITER.

Physical, physiological, and psychological material pertinent to an understanding of the speaking process.

351-352. *PRINCIPLES OF SPEECH CORRECTION*. Throughout the year. Credit three hours a term. T Th S 9. Mr. THOMAS.

Study of principles and methods, correlated with supervised practice in the Speech Clinic.

SPEECH CLINIC. For students working under the direction of the Department.

DRAMATIC PRODUCTION

DRAMA AND THEATRE. (See Literature 301-302.)

401. *DRAMATIC PRODUCTION: DIRECTION*. Fall term. Credit three hours. For upperclassmen and graduates. M W F 11. Mr. STANTON.

Theory of stage direction; fundamentals of theatrical mounting; survey of practical phases of production. Lectures, exercises, and reports. Prerequisite for further work in Dramatic Production.

405. *ADVANCED DRAMATIC PRODUCTION: DIRECTION*. Fall term. Credit three hours. Open to upperclassmen by consent of the instructor. T 2-4 and an hour to be arranged. Mr. STANTON.

Laboratory practice in the direction and production of plays.

421. *ADVANCED DRAMATIC INTERPRETATION*. Spring term. Credit three hours. For graduates and, by consent of the instructor, for upperclassmen majoring in the Department. W 2-4:30. Mr. ALBRIGHT.

Practice in acting, directing, and group rehearsal, leading to public presentations in the Laboratory Theatre; individual drills, pantomimes, and reading exercises.

431. *DRAMATIC PRODUCTION: STAGECRAFT*. Spring term. Credit three hours. Prerequisite, consent of the instructor. Not open to freshmen. M W 11 and T 2-4. Mr. STANTON.

The theory and practice of stage production; planning of small theatres; stage arrangement; problems and practice in scene construction, design, and elements of lighting. Lectures, demonstrations, reports.

433-434. *THEATRE PRACTICE*. Throughout the year. Credit two hours a term. Open by consent of the instructor to upperclassmen who have taken or who are taking Speech and Drama 141 or 401. Hours to be arranged. Messrs. STANTON, ALBRIGHT and the staff of the University Theatre.

Projects in the productions of the University Theatre.

437. *DRAMATIC PRODUCTION: STAGE LIGHTING*. Spring term. Credit three hours. T Th 12. Laboratory, Th 2-4:30. Mr. STANTON.

451. *HISTORY OF THE THEATRE*. Spring term. Credit three hours. Open to upperclassmen. M W F 12. Mr. DRUMMOND.

The development of the theatre, with special attention to the period theatres and theatrical styles which influence modern stage presentation.

[455. *AMERICAN DRAMA AND THEATRE*. Not offered in 1948-1949.]

461-462. *PLAYWRITING*. Throughout the year. Credit three hours a term. F 2-4:30. Mr. DRUMMOND.

475. *THEORIES OF DRAMATIC PRODUCTION*. Fall term. Credit three hours. Primarily for graduates; open to seniors by consent of the instructor. W 2-4:30. Mr. DRUMMOND.

The chief theories of dramatic production in relation to aesthetic principles.

The Department calls the attention of students interested in Dramatic Production to the following courses: those listed under The Fine Arts; English 341-342 and 369-370; History of Costume (in the College of Home Economics); Arts of Design (in the College of Architecture). Three prizes in playwriting are offered under the auspices of the Department in 1948-1949: the Heermans Prize for One-Act Plays on an American Theme; the University Theatre Prize for New York State Regional Plays (open both to graduates and undergraduates); and the Cornell Dramatic Club Prize (no restriction as to theme).

ZOOLOGY

Mr. H. B. ADELMANN, *Chairman*; Messrs. A. A. ALLEN, W. R. EADIE, P. W. GILBERT, D. R. GRIFFIN, W. J. HAMILTON, JR., P. P. KELLOGG, S. L. LEONARD, J. W. PAPEZ, E. C. RANEY, W. A. WIMSATT, B. P. YOUNG.

For a major in Zoology there must be completed: (1) Zoology 101-102, or 103-104, and eighteen other hours selected from Zoology 211-212, 222, 301, 304, 451-452, 515-516, 8, 9, and Physiology 303; and (2) fifteen hours in related fields, selected from courses in Bacteriology, Chemistry, Biochemistry, Botany, Entomology, Geology, Physics, Human Physiology, or Plant Breeding 101.

Choice of all courses should be made at a conference with the student's adviser.

Students who are planning to study medicine should make sure that they select a major that will include the entrance requirements of the medical school of their choice. Information as to advisers and the entrance requirements of medical schools may be obtained at the office of Professor L. L. BARNES, Rockefeller 155.

Provisions are made for a limited number of students to undertake Informal Study.

Introductory Zoology (Zoology 101-102), or General Zoology (Zoology 103-104), or their equivalents, is a prerequisite for all courses in the Department except Zoology 9.

COURSES OFFERED IN THE COLLEGE OF ARTS AND SCIENCES

101-102. *INTRODUCTORY ZOOLOGY*. Throughout the year. Credit three hours a term. If taken after Biology 1, credit two hours a term. Intended for students in Arts and Sciences. Zoology 101 prerequisite to Zoology 102. Lectures, T Th 9 or 12, Stimson G-25. Laboratory, M T W Th or F 2-4:20; T or F 10-12:20; or S 9-11:20. Stimson 104 and 116. Mr. YOUNG and assistants.

During the first term attention is centered primarily on human structure and function as an example of the organization and activities to be expected in multicellular

organisms. Fundamental biological principles are presented which contribute to the student's understanding of himself and the world in which he lives.

The second term includes a systematic survey of the structures, functions, and life activities of representative types of animals from protozoans to man. The economic importance of animals to mankind and the origin and relationship of man to other animals are emphasized.

103-104. *GENERAL ZOOLOGY*. Throughout the year. Credit three hours a term. If taken after Biology 1, credit two hours a term. Intended for students in Agriculture and Home Economics. Lectures, T Th 8 or 11. Laboratory, M T W Th or F 2-4:20, M 10-12:20, or S 9-11:20. Mr. LEONARD and assistants.

This course will survey the various branches of the zoological sciences to serve as a background for advanced work in the study of animals.

The principles of zoology will be illustrated by the study of representative animals with emphasis on those of economic importance to agriculture and to man. Emphasis will be placed on the biology of the vertebrates including the structural, functional, developmental, and genetic aspects.

211-212. *COMPARATIVE ANATOMY OF VERTEBRATES*. Throughout the year. Credit three hours a term. Prerequisite, Zoology 101-102, or 103-104, or the equivalent. Lecture, M 8 or 9. Laboratory, M F or T Th 2-4:30; W F or T Th 8-10:30; or W 2-4:30 and S 8-10:30. Mr. GILBERT and assistants.

A thorough study and dissection of representative vertebrate types, including fish, amphibian, reptile, bird, and mammal, together with demonstrations on species other than the types dissected.

The course is intended to give students an evolutionary background for the study and appreciation of the structure of higher vertebrates, including man.

222. *PHYSICAL ANTHROPOLOGY AND HUMAN EVOLUTION*. Spring term. Credit three hours. Lectures, M W F 12. Mr. PAPEZ.

Eras of vertebrate evolution, with special reference to the primates; prehistoric man; physical anthropology; and modern races and peoples.

224. *COMPARATIVE NEUROLOGY*. Spring term. Credit three hours. Prerequisite, nine hours of Animal Biology. Lectures, T Th 12. Laboratory, M 2-4:30. Mr. PAPEZ.

A comparative study of the vertebrate nervous system based on dissections of brains of dog and man, and sections of primate brain stem; study of the neural mechanisms that determine the receptive, motor, and autonomic functions of the nervous system.

301. *HISTOLOGY: THE BIOLOGY AND DEVELOPMENT OF THE TISSUES*. Fall term. Credit four hours. Prerequisite, Zoology 101-102, or 103-104, and 211-212. Lectures, T Th 11. Laboratory, T Th 8-10:30 or 2-4:30. Mr. WIMSATT and assistants.

A general survey of the structure and development of the tissues. The treatment is general, designed to provide students of biology with a basis for the understanding of normal and abnormal structure of the vertebrates. Each student will make for his own use a series of typical microscopic preparations.

302. *THE ORGANS: HISTOLOGY AND DEVELOPMENT*. Spring term. Credit four hours. Prerequisite, Zoology 301. Lectures, W F 9. Laboratory, W F 2-4:30. Mr. WIMSATT and assistants.

A continuation of Zoology 301. Zoology 301 and 302 together give the fundamental

facts of the microscopic structure and development of the body. There is also offered opportunity to gain knowledge of technique in the fixing, embedding, and sectioning of selected organs.

304. *VERTEBRATE EMBRYOLOGY*. Spring term. Credit five hours. Lectures, T Th 11, S 10. Laboratory, T Th 8-10:30 or 2-4:30. Mr. ADELMANN and assistants.

An introduction to general vertebrate embryology designed to provide a basis for the appreciation of biological problems. The material is treated comparatively with particular emphasis on the development of the amphibian, the bird, and the mammal. A few invertebrate forms are used where desirable for illustration.

451-452. *COMPARATIVE PHYSIOLOGY*. Throughout the year. Credit three hours a term. Prerequisites, one year of General Biology or Introductory Zoology, and Elementary Physics and Chemistry. Organic Chemistry and Comparative Anatomy are also desirable. Lectures, W F 9. Laboratory, W or F 1:40-4:30. Mr. GRIFFIN.

This course is designed to provide advanced undergraduates and graduate students with a knowledge of the functional aspects of zoology, either as a preparation for advanced work in biology or to aid in an appreciation of the manifold complexities of animal form and behavior. Throughout the course the emphasis will be on the comparative aspects of the various physiological processes such as: metabolism, respiration, the transport of respiratory gases, digestion, the circulation of blood and other fluids, the action of effector tissues such as muscles and glands, the functions of nervous systems and receptor systems of varying degrees of complexity, and the homeostatic mechanisms which maintain osmotic pressure, water content, pH, temperature, and other physiological variables within narrow limits.

485. *GENERAL PHYSIOLOGY*. Fall term. Credit four hours. Prerequisites, one year of Zoology, one year of Physics, Inorganic and Organic Chemistry, and a laboratory course in Physiology. Calculus, Biochemistry, and Physical Chemistry are also desirable. Lectures, T 9; seminars and individual laboratory projects at hours to be arranged. Mr. GRIFFIN.

The subject matter of this course will vary from year to year. There will be one lecture each week outlining an important topic in the field of general physiology, but the course will consist largely of individual projects including both reading and original sources and secondary material and laboratory experiments. This individual work will be discussed, integrated, and amplified in a weekly three-hour seminar.

515-516. *INVERTEBRATE ZOOLOGY*. Throughout the year. Credit three hours a term. Prerequisites, Zoology 101-102, or 103-104, or equivalent. Lecture, S 9. Laboratory, F 2-4:20, and S 10-12:20. Mr. YOUNG.

Course deals with the body plans, the physiology, taxonomy, and the development of the major groups of animals lacking backbones. Life histories of animals affecting the welfare of man are stressed. Field trips permit the observation of these animals in their natural environments.

Open to students interested in animals, including undergraduate majors and graduate students in the various fields of biology.

040. *RESEARCH PROBLEMS*. Ordinarily limited to seniors only. Credit to be arranged. Problems may be undertaken in any phase of Zoology, but the consent of the instructor concerned is a prerequisite. Hours to be arranged.

COURSES OFFERED IN THE N. Y. STATE
COLLEGE OF AGRICULTURE

8. *ELEMENTARY TAXONOMY AND NATURAL HISTORY OF VERTEBRATES*. Throughout the year. Credit three hours a term. Prerequisites, Zoology 101-102, or 103-104, or Biology 1. Lecture, M 8. Laboratory, M W or T Th 2-4:30. Mr. HAMILTON and Mr. RANEY.

Lectures on fishes, amphibia, reptiles, birds, and mammals, dealing with the principles of classification and nomenclature, characteristics, relationships, and bionomics of these groups. The laboratory gives practice in the identification of North American species. Field studies of the local fauna are undertaken during the fall and spring. During May, field trips will be taken at 5:30 A.M.

9. *GENERAL ORNITHOLOGY*. Spring term. Credit three hours. Open to all students. Lecture, W 11. Field work and laboratory, M W or T Th 2-4:30. Mr. ALLEN and Mr. KELLOGG.

Introduction to the study of birds, particularly the local species; their songs and habits; designed to give a working knowledge to those wishing to study birds as an avocation, and fundamental to those planning advanced work in ornithology or wild life conservation. Laboratory work with bird skins is based on the field work.

22. *ICHTHYOLOGY, ADVANCED SYSTEMATIC AND FIELD ZOOLOGY*. Spring term. Credit three hours. Lectures, T Th 8. Laboratory, F 2-4:30. Mr. RANEY.

The lectures cover speciation, classification, life histories, distribution, and literature of fishes. Laboratory periods are utilized in field trips which emphasize ecological studies, and indoor studies on structure and taxonomy of fishes.

23. *HERPETOLOGY*. Fall term. Credit three hours. Lectures, T Th 8. Laboratory, F 2-4:30. Mr. HAMILTON and Mr. RANEY.

An amplification of the prerequisite course 8. The lectures are devoted to the taxonomy and ecology of living amphibia and reptiles and to their geographical distribution. Laboratory periods are devoted to the identification of exotic and indigenous forms.

[25. *MAMMALOLOGY*. Fall term. Credit three hours. Lectures, T Th 8. Laboratory, F 2-4:30. Mr. HAMILTON.

Discussion of principal phases of mammalian life; origin, distribution, habits, and literature. Laboratory periods are devoted to methods of field collecting, census taking, life history studies, preparation of skins and skeletons, and identification of North American species. Not offered in 1948-1949.]

67. *SEMINAR IN SYSTEMATIC VERTEBRATE ZOOLOGY*. Fall term. Without credit. Registration by consent of the instructor. T 4:40. Mr. HAMILTON and Mr. RANEY.

Life-zone plans of North America; distribution and origin of life in North America; zoogeography of the Old World; animal coloration; and other topics.

112. *LITERATURE OF ECONOMIC ZOOLOGY, CONSERVATION, AND ECOLOGY*. Spring term. Credit one hour. Limited to upper class students and graduates. T 4:45. Mr. HAMILTON and Mr. RANEY.

The literature of economic zoology, ecology, oceanography, and kindred fields; fish and fisheries; aquaria; amphibians and reptiles, their uses; zoological gardens; preserves; game farms, animals in relation to recreation.

126. *ADVANCED ORNITHOLOGY*. Fall term. Credit three hours. Prerequisite, consent of the instructor. Lecture, W 11. Laboratory, T Th 2-4:30. Mr. ALLEN and Mr. PARKES.

The structure and classification of birds; geographical distribution; the literature and institutions of ornithology; identification of representative birds of the world. The first part of the term is devoted to field work on the fall migration, and to the identification of birds in winter plumage.

131. *TECHNIQUE IN ORNITHOLOGY*. Fall term. Credit three hours. Prerequisites, Zoology 607-608 and 110, Botany 13, and Entomology 12, or consent of the instructor. Primarily intended for students planning advanced work in ornithology. Lecture, W 9. Laboratory, M W 2-4:30. Mr. KELLOGG.

An introduction to methods of research in ornithology. Field collecting, preparation of specimens, natural history, photography and sound recording are emphasized, along with biological survey methods, food studies, and preparation and presentation of scientific papers.

133. *BIRD SPECIATION AND MUSEUM METHODS IN ORNITHOLOGY*. Fall term. Credit three hours. Open to seniors planning to participate in scientific expeditions and to carry on taxonomic work in ornithology. Prerequisites, Zoology 110, 211-212, 607-608, 727 and 731, or consent of the instructor. S 8-1. Mr. PARKES.

The course emphasizes a study of the philosophy of classification and the way in which genera, species, and races have come into being. It aims to establish a sound basis for taxonomy and museum methods of preserving data.

136. *SEMINAR IN ORNITHOLOGY*. Throughout the year. Without credit. Open to qualified undergraduates and required of all graduate students in ornithology. M 7:30-9. Messrs. ALLEN and KELLOGG.

400. *RESEARCH PROBLEMS*. Ordinarily limited to seniors only. Credit to be arranged. Problems may be undertaken in any phase of Zoology, but the consent of the instructor concerned is a prerequisite. Hours to be arranged.

ADDITIONAL COURSES IN BIOLOGICAL SCIENCE

BIOCHEMISTRY

Students who intend to register for advanced work in Biochemistry should consult Mr. HAROLD H. WILLIAMS, Savage Hall.

10. *ELEMENTS OF BIOCHEMISTRY*. Fall term. Credit four hours. Prerequisite, Chemistry 303 and 305, or Food and Nutrition 215. Primarily for students in the College of Home Economics. Lectures, M T Th S 8. Mr. WILLIAMS.

An elementary course dealing with the chemistry of biological substances and their transformations (digestion and metabolism) in the animal organism.

11. *ELEMENTS OF BIOCHEMISTRY*. Fall term. Credit two hours. Prerequisite or parallel course, Biochemistry 10. Laboratory, T Th 2-4:20, or W 2-4:20 and S 9-11:20. Mr. WILLIAMS, and assistants.

Laboratory practice with biochemical substances, and experiments designed to illustrate chemical reactions which may occur in the animal body.

101. *GENERAL BIOCHEMISTRY*. Fall term. Credit four hours. Prerequisites, Chemistry 215 or the equivalent; and 303 and 305 or the equivalent. For graduate

and advanced undergraduate students. Lectures, M W F S 11. Mr. WILLIAMS.

The course deals with the chemistry of plant and animal substances and the reactions occurring in biological systems.

102. *GENERAL BIOCHEMISTRY*. Fall term. Credit two hours. Prerequisite or parallel course, Biochemistry 101. Laboratory, M W or T Th 2-4:20. Mr. WILLIAMS, and assistants.

Laboratory practice with plant and animal materials, and the experimental study of their chemical properties.

BIOLOGY

1. *GENERAL BIOLOGY*. Throughout the year. Credit three hours a term. The course may be begun in either term. Not open to students who have had both Zoology 101-102 and Botany 1. If Biology 1 is taken after either Zoology 101-102, or Botany 1, credit two hours a term. Lectures and demonstrations, M W 9 or 11. Laboratory, M T W Th or F 2-4:30, or T or S 10-12:30. Mr. HOOD and assistants.

An elementary course planned to meet the needs of students majoring outside of the plant and animal sciences; particularly adapted as the first year of a two-year sequence in biology for the prospective teacher of general science in the secondary schools. The course deals with the nature of life, life processes, the activities and origin of living things. It covers the organization of representative plants and animals, including man as an organism, and the principles of nutrition, growth, behavior, reproduction, heredity, and evolution.

ENTOMOLOGY

For details of other courses in Economic Zoology, Entomology, and Limnology offered in the College of Agriculture, see the Announcement of that College.

12. *GENERAL ENTOMOLOGY*. Fall term. Credit three hours. Prerequisite, Biology 1, Zoology 101-102, or Botany 1. Lectures, W F 9. Practical exercises, T W Th or F 2-4:30. Mr. MATHESON and others.

Lectures on the characteristics of orders, suborders, and the more important families, and on the habits of representative species; practical exercises in studying the structure of insects, their biology, their habits, and their classification.

[51. *PARASITES AND PARASITISM*. Spring term. Credit two hours. Prerequisite, Biology 1, or Zoology 101-102. Mr. MATHESON. Not offered in 1948-1949.]

A consideration of the origin and biological significance of parasitism, and of the structure, life, and economic relations of representative parasites.

52. *MEDICAL ENTOMOLOGY*. Spring term. Credit three hours. Prerequisite, Zoology 101-102, or Biology 1. Lecture, Th 10. Laboratory, Th or F 2-4:30 and one recitation period to be arranged. Mr. Matheson and others.

This course deals with insects and other arthropods that are the causative agents of disease in man and other animals, or are the vectors, or intermediate hosts, of disease-producing organisms.

PHYSIOLOGY

*303. *HUMAN PHYSIOLOGY*. Either term. Credit three hours. Prerequisite, a previous course, either in high school or college in Biology and in Chemistry. Open

to students in the Colleges of Arts and Sciences, Home Economics, Agriculture, and others. M W F 10. Mr. DYE and Miss McCANDLESS.

This is an introductory course. Lectures, illustrations, and demonstrations.

305. *ENDOCRINOLOGY AND METABOLISM*. Fall term. Credit three hours. Prerequisites, six or more hours of Biology, and a previous or parallel course in Organic Chemistry. Open to upperclassmen and graduate students. M W F 8. Mr. DYE.

INTERDEPARTMENTAL COURSES

See also a special bulletin issued by the Department of Psychology concerning the offerings of all the Schools and Colleges of this University in that subject.

The following course is offered cooperatively by the Departments of Agricultural Economics, Botany, Entomology, Forestry, Rural Education, and Zoology:

*1. *THE CONSERVATION OF WILD LIFE*. First term. Credit two hours. Messrs. ALLEN, GUISE, HAMILTON, HILL, KELLOGG, MUENSCHER, PALMER, and WEBSTER, and cooperating specialists. Lectures, T Th 11 and occasional evenings. Fernow 122.

An introduction to the wild-life resources of North America; the importance of the flora and fauna in our economic and cultural life; the history of its decimation, the present need for conservation, and the methods employed to reestablish the various species.

The following course is offered cooperatively by the departments of Zoology and Psychology:

201-202. *HUMAN GROWTH AND DEVELOPMENT*. Throughout the year. Credit three hours a term. Not open to freshmen. Prerequisite, a laboratory science, preferably General Biology or Zoology. Course 201 is prerequisite to course 202. Course 201—Fall term: Lectures, T Th 10; Recitation, M 8, T 8, 9, 11, 12, Th 8, F 8, 10, 11. Mr. PAPEZ. Course 202—Spring term: Lectures, T Th 10; Recitations, T 8, T 9, Th 9, Th 11, F 8, 10, S 10. Mr. FREEMAN.

The aim of this course is to integrate information about structural, physiological, behavioral, and intellectual aspects of growth and development that will help educators to understand human individuals as functioning organisms in a social environment. The materials of the course are selected from pertinent fields, including anatomy, embryology, genetics, neurology, physiology, hygiene, sociology, cultural anthropology, developmental psychology, and education.

STATISTICS

Interdepartmental Committee: Mr. J. E. MORTON, *Acting Chairman*; Messrs. M. BLACK, D. ENGLISH, W. FELLER, M. KAC, H. J. LOBERG, H. H. LOVE, P. J. MCCARTHY, F. A. PEARSON, T. A. RYAN, A. SCHULTZ.

A knowledge of statistical reasoning is becoming an increasingly necessary part of a general education, since such reasoning is essential in so many walks of life. The layman as well as the specialist has need for some comprehension of this subject. In the theoretical and applied sciences, there is an increased use of statistical methods for summarizing data, making estimates, and deriving valid inferences. Principles of statistical reasoning are used in designing efficient procedures for surveys, tests, and experiments as well as in analyzing and interpreting their results.

Recognizing their common interests in statistical methods, a number of departments have joined in sponsoring the following courses:

101. STATISTICAL REASONING. Either term. Credit three hours. No prerequisites. Freshmen admitted only by consent of the instructor.

An introduction to basic concepts and uses of descriptive statistics and problems of drawing valid inferences from statistical data. This course may be taken as a prerequisite to certain of the specialized courses on applications of statistics offered in various departments. It is not intended for students who have had, or are planning to take, college mathematics through calculus; such students should take Statistics 103. Specific topics included are: classification, averages, dispersion, correlation, probability, tests of significance, confidence intervals, graphic presentation.

103-104. INTRODUCTION TO STATISTICAL ANALYSIS. Throughout the year. Credit three hours a term. (Credit will not be given for both Statistics 101 and 103-104. Prerequisites, Mathematics 153, or 171, or the equivalent for the first term, Mathematics 154, or 172, or the equivalent for the second term.)

An introduction to the fundamental pattern of thought and principal techniques of statistical analysis. This course provides a more thorough grounding in statistical methods than does Statistics 101, and is a prerequisite for advanced courses in Statistics.

[106. STATISTICAL TABULATION AND COMPUTING. Credit two hours. Spring term. Prerequisite, Statistics 103-104, or the equivalent.]

Organization and layout of tabulations and computations for efficient use of computing personnel and machines. Systematic checks on accuracy. Use of coding and tables. Assigned individual projects. Not offered in 1948-1949.]

ADVANCED COURSES IN STATISTICS

PROBABILITY. (See Mathematics 721-722.)

ADVANCED PROBABILITY. (See Mathematics 723-724.)

[203-204. ADVANCED STATISTICAL ANALYSIS. Throughout the year. Credit three hours a term. Prerequisite, Mathematics 721-722.]

Modern theory and techniques of estimation and tests of hypotheses. Various forms of application to quantitative and qualitative data and problems relating the statistical analysis to other phases of research. Not offered in 1948-1949.]

205-206. THEORY AND METHODS OF SAMPLING. Throughout the year. Credit three hours a term. Prerequisite, one term of Statistics for first semester; Statistics 103-104, or consent of instructor for second semester.

The problem of designing sampling procedures to meet specified standards of accuracy, cost, and other operating characteristics. Effective utilization of prior information. Effect of biases and errors of observation on efficiency of sampling methods. Multiple and sequential sampling. Examples from inspection of manufactured products, social and economic surveys, agricultural experiments, market analysis, personnel studies, etc.

[275-276. SEMINAR ON CURRENT ADVANCES IN STATISTICAL RESEARCH. Throughout the year. Credit two hours a term.]

For graduates and advanced undergraduates. Members of the faculty will participate. Prerequisite, consent of the Interdepartmental Committee on Statistics. Not offered in 1948-1949.]

DEPARTMENTAL COURSES RELATED TO STATISTICS

Specialized courses in or closely related to statistics are offered in departments and colleges as follows:

COLLEGE OF AGRICULTURE:

Agricultural Economics 111, 112, 115, 215

Plant Breeding 211, 212

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COLLEGE OF ARTS AND SCIENCES:

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Psychology 375

Sociology 202, 311, 312

COLLEGE OF ENGINEERING:

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SCHOOL OF INDUSTRIAL AND LABOR RELATIONS:

Industrial and Labor Relations 40, 41, 103, 113

CLINICAL AND PREVENTIVE MEDICINE

This course may be counted among the thirty hours of non-Arts courses allowed to students in the College of Arts and Sciences.

2. *CLINICAL NUTRITION.* Spring term. Credit two hours. Prerequisites, a course in nutrition, in physiology, and in biochemistry. Registration by permission of the instructor. For graduate students only. T Th 12. Associate Professor YOUNG and members of the medical staff.

This course is designed to familiarize the student with some of the applications of nutrition to clinical problems.

MILITARY SCIENCE AND TACTICS

(Students who have been enrolled in the Armed Services and students completing satisfactorily the first four terms of the Naval ROTC program are excused from the requirement.)

1. *BASIC COURSE.* Throughout the year. This course, conducted throughout the year, is required (with the exception of those specified above) of all able-bodied first-year and second-year male students who are American citizens and candidates for a baccalaureate degree. The requirements of Military Science and Tactics must be completed in the first two years of residence. Otherwise, the student will have to obtain consent of the Faculty to register again in the University. For students entering with advanced standing, the number of terms of Military Science required is to be reduced by the number of terms which the student has satisfactorily completed (whether or not Military Science was included in his program) in a college of recognized standing. Three hours a week on any afternoon from Monday through Friday, commencing at 1:40 P. M.

Basic instruction in Leadership, Rifle Marksmanship, The World Military Situation, Evolution of Warfare, and a study of maps and aerial photographs are the

major subjects offered in this course. Further details may be obtained at Barton Hall, or in the Announcement of the Department of Military Science and Tactics.

2. *ADVANCED COURSE.* Throughout the year. Credit three hours a term. This course appeals to those students who are aware of the country's need for specially trained men in the event of a national emergency, and to those potential leaders who desire advanced training in leadership. Students who have completed the Basic Course or have had one year of service with any of the Armed Forces, are eligible for enrollment. Six months with the Armed Forces credits a student with one year of the Basic Course toward Advanced ROTC requirements. By taking a second year of the Basic Course, he may complete this requirement. Five hours a week are required.

Tactics and Technique is taught in five of the arms and services including Air, Field Artillery, Ordnance, Signal Corps, and Quartermaster Corps; and the attendance at one summer camp for six weeks is required. Instruction is also provided in such general subjects as Military Problems of the United States; Psychological Warfare; Military Leadership, Psychology and Personnel Management; Command and Staff Functions, by specialists in these fields, including lectures from other departments, schools, and colleges of the University.

During the course, the student receives a substantial government allowance and a regulation officer's uniform. The complete course covers two years.

Completion of the Advanced Course qualifies students for commissions as Second Lieutenants of the Officers' Reserve Corps, U. S. Army.

NAVAL RESERVE OFFICERS TRAINING CORPS

The course in Naval Science, which is four years in length, and normally requires three class-room hours a week plus certain laboratory periods and summer cruises, is designed to prepare the student to accept a commission either in the Line, Marine Corps, Supply Corps, or the Civil Engineer Corps of the Regular Navy or the Naval Reserve. In the case of students pursuing a five-year course at this University, the Naval Science course may be taken during either the first or the last four years. Undergraduates in the Naval ROTC may take any university course leading to a baccalaureate degree. Students are entered in either of two categories: Regular and Contract.

Regular Students gain admission through nationwide examinations conducted by the Naval Examination Section of the College Entrance Board. Tuition, books, and usual fees are paid by the Navy, and, in addition, students are paid \$600.00 a year. They are required to serve two years as Ensigns in the Regular Navy, or Second Lieutenants in the Marine Corps, upon graduation.

Contract Students are selected by the Professor of Naval Science from applicants of the freshman class who have already been admitted to the College of Arts and Sciences. They are paid approximately \$24.00 a month their junior and senior years, are commissioned in the Naval Reserve or the Marine Corps Reserve, and are placed on inactive duty upon graduation.

Candidates in both categories must have attained the age of seventeen years before September first of the year of enrollment and must not have attained the age of twenty-five years before July first of the year in which commissioned.

For further information write to the Professor of Naval Science, Naval ROTC unit, Cornell University, Ithaca, N. Y.

All NROTC students enrolled in the College of Arts and Sciences must fulfill all of the requirements of that College as well as the requirements of the Naval ROTC, which include, in addition to twenty-four hours of Naval Science subjects, the following:

(1) By the end of the sophomore year, every student must have satisfactorily completed one year of college physics.

(2) By the end of the sophomore year, every student must have completed satisfactorily mathematics courses through trigonometry.

(3) Every student must achieve proficiency in written and oral expression. The College will prescribe standards of proficiency and determine procedures necessary to achieve them.

(4) Four years of physical training must be taken by every student. This requirement shall be compatible with the facilities of the school.

(5) Each student shall take such instruction in swimming as to qualify him as a First Class Swimmer as described in Nav Pers 15007, *Physical Fitness Manual of the U. S. Navy*. In addition, skill in elementary lifesaving and resuscitation should be acquired.

The following Naval Science courses may be counted among the ninety hours within the College of Arts and Sciences:

N. S. 301. *PILOTING AND NAVIGATION*. Credit three hours.

N. S. 302. *ADVANCED NAVIGATION AND TACTICS*. Credit three hours.

Twelve of the remaining eighteen hours of required Naval Science courses may be counted among the thirty hours which may be taken outside the College of Arts and Sciences by students in the College.

PHYSICAL TRAINING: MEN

(Students who have been discharged from the Armed Forces are exempted from this requirement.)

All undergraduate men (with the exception of those specified above) must pursue four terms of work, three hours a week, in Physical Training. Ordinarily, this requirement must be completed in the first two years of residence; postponements are to be allowed only by consent of the University Faculty Committee on Military Science and Physical Training.

Exemption from this requirement may be made by the Committee designated above, when it is recommended by the medical office or when unusual conditions of age, residence, or outside responsibilities require it.

For students entering with advanced standing, the number of terms of Physical Training required is to be reduced by the number of terms which the student has satisfactorily completed (whether or not Physical Training was included in his program) in a college of recognized standing. Mr. WILSON and assistants.

PHYSICAL EDUCATION: WOMEN

(Students who have been discharged from the Armed Forces are exempted from this requirement.)

All undergraduate women (with the exception of those specified above) must complete this requirement in the first two years of residence, by taking Physical Educa-

tion 6 and 7. Required of all Freshmen: fundamentals and rhythmic. Three hours a week. Misses **ATHERTON**, **BATEMAN**, **STEWART**, **ANDERSEN**, **RIVERS**, and Mesdames **BAIRD** and **BROWN**.

Other activities included in this program: archery, badminton, baseball, bowling, basketball, canoeing, folk and square dancing, field hockey, golf, individual gymnastics, modern dance, outing riflery, soccer, tennis, volleyball. For further information, see Bulletin of the Department of Physical Education for women.

SOPHOMORES: Throughout the year. Three periods a week.
For description, see Physical Education 6.

THE DANCE

(Credit for this course will be counted among the thirty hours of "non-Arts" courses allowed by this College.)

ADVANCED DANCE COMPOSITION. Throughout the year. Credit three hours a term. Prerequisites, consent of the instructor, and elementary dance composition, and dance technique. Lectures and discussions, M 4:30, T 4:30. Laboratory, Th 7:30-9:30. Also a rehearsal schedule to meet production demand throughout the term. Miss **ATHERTON**.

Under the three general headings above, the course offers background in the history of the dance, experience in composition of dance forms, and in the technique of dance movement. Assigned readings. The production schedule varies in time demand throughout the year.

CAMP COUNSELOR TRAINING

Spring term. Credit two hours. Lectures, first seven weeks, M and W 3:15. Laboratory, second seven weeks, 3:15-5:15. Miss **STEWART**.

A study of values of camping; organization and administration of camps; qualifications and responsibilities of the counselor; instruction in camp crafts.

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CORNELL UNIVERSITY OFFICIAL PUBLICATION

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Correspondence regarding these publications should be addressed to

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